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CASSELL'S DICTIONARY OF GARDENING



EDITED BY
WALTER P. WRIGHT

HORTICULTURAL SUPERINTENDENT
UNDER THE KENT COUNTY COUNCIL
AUTHOR OF "PICTORIAL PRACTICAL
GARDENING" EDITOR OF "THE GARDENER"
ETC.

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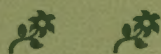
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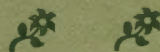
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MRS. ERIC HAMBRO.

CASSELL'S

DICTIONARY OF GARDENING

AN ILLUSTRATED ENCYCLOPÆDIA
OF
PRACTICAL HORTICULTURE FOR ALL CLASSES

EDITED BY

WALTER P. WRIGHT

HORTICULTURAL SUPERINTENDENT UNDER THE KENT COUNTY COUNCIL,
AUTHOR OF "PICTORIAL PRACTICAL GARDENING," EDITOR OF "THE GARDENER," ETC.

CASSELL AND COMPANY, LIMITED

LONDON, PARIS, NEW YORK & MELBOURNE

1901

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TO THE
ALASKA

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11

mainly
spice



PREFACE.

THE literature of gardening increased by leaps and bounds during the closing years of the nineteenth century, and the first few months of the twentieth saw an enormous influx of books on the subject. There is evidence in abundance, in this and in other directions, that interest in horticulture has grown, and is growing, rapidly.

In adding to horticultural literature an item so considerable as a dictionary of nearly a thousand pages, graced with upwards of one thousand illustrations, Editor and Publishers base their hopes of success (1) on the signs and tokens of increased interest in gardening just referred to; (2) on the surprising scarcity of books bearing this simple form; (3) on giving a value for the money asked never before attempted; (4) on the absolutely practical nature of the publication, which caters neither for the scientist nor the dilettante, but merely for the cultivator.

Cassell's *DICTIONARY OF GARDENING* is not a mere list of names and phrases. Its leading idea is to choose from the hundreds of thousands of plants in cultivation all that are worthy of being grown, and to tell everything about them that the cultivator is likely to want to know. Thus, it commences its remarks on each subject with a description, follows with information on (1) propagation, (2) soil, and (3) general culture, and adds lists of species and varieties, telling the height to which they grow, the month in which they bloom, their hardiness or otherwise, and the colour of their flowers. The lists are divided into two sections, "Principal Species" and "Other Species," as an aid to selectors.

Its illustrations comprise practical as well as ornamental figures, showing almost every operation of the garden.

Its language is absolutely free from technicalities. An attempt has been made to show plain gardening with no resources but those of the English language.

Attention is called to some of the omissions. After careful consideration the derivations of generic names have been left out in order to make room for more cultural matter. For gardening purposes they are mostly useless, and a very large number are inconceivably stupid. "*Cimicifuga*, from *cimex*, a bug, and *fugo*, to drive away, in allusion to its supposed virtue." Admirable, no doubt, but the horticulturist would rather leave his *Cimicifuga* in the garden when he contemplated a stay at an Arab hotel, and trust to Keating's insect powder. At the same time, the meaning of a very large number of Latin and other specific names and phrases will be given in the Glossary.

While giving the native country of many of the most interesting genera, I have decided not to waste space on the habitat and year of introduction of every species mentioned. An examination into the merits of these points, during which many works were consulted, established the fact that the available information is as conflicting as—from a practical point of view—it is misleading.

Immeasurably the most troublesome knot to cut was that of nomenclature. I could not bring myself to exclude a good garden name for no other reason than that a botanical authority described the same plant by another, more particularly when a second authority disagreed with him. I have adopted the rule of alluding to a plant by the name under which horticulturists know it, and of likewise mentioning that particular botanical name

which the differences of botanists have left the most prominent. The *Genera Plantarum*, the *Index Kewensis*, and the Kew *Hand-Lists* have all been carefully consulted, and, if anyone attacks me, I have at least the satisfaction of contemplating an array of ponderous tomes ready to hurl at him, the weight of which will cause him severe shocks and smarts. In most cases of conflict between authorities, the official Kew publications have been taken as decisive.

Kew has been followed, though not without reluctance, in dropping capitals from Latinised adjectival names, but this is no great matter.

The task of dictionary-making bristles with pitfalls, and it is idle to suppose that there is no weak spot for the carping critic to assail. But carping critics, if in the main less important than they affect to be, have their uses as advertising media, and while protesting that nothing which care and diligence can do to make the work perfect has been left undone, I beg to express a hope that the man who finds errors, and sets out to expose them, will do so in as large type as possible.

I desire to acknowledge much valuable assistance in preparing this work from Mr. S. Arnott, of Carsethorn, N.B., Mr. John Fraser, of Kew, Mr. Alexander S. Galt, late of Kew, and Mr. Horace J. Wright, formerly of the Jardin des Plantes, Paris; as well as useful contributions from Mr. George H. Hollingworth, formerly of Alton Towers Gardens, and now of my lecturing staff. Whenever wrestles with names seemed like driving me to distraction, one or other of these gentlemen came cheerfully along to smooth the tangled way, and help reason to retain her seat.

WALTER P. WRIGHT.

ABBREVIATIONS.

The following are the principal abbreviations used throughout the work. *Height*: ', feet; ", inches. *Months*: Jan., January; Feb., February; Mch, March; Ap., April; My., May; Je., June; Jy., July; Aug., August; Sep., September; Oct., October; Nov., November; Dec., December. *Hardiness*: hdy., hardy; hlf-hdy, half-hardy; grh., greenhouse; st, stove. *Duration or Character*: ann., annual; bien., biennial; per., perennial; shr., shrub; cl., climber; ev., evergreen. *Colour*: bl., blue; crim., crimson; sc., scarlet; wh., white; vio., violet; lil., lilac; pur., purple; yel., yellow; ro., rose; car., carmine; or., orange; br., brown; blk., black. *Miscellaneous*: ord., natural order; syn., synonym; lvs., leaves; var., variety

The principal cross references are given in the body of the pages; minor cross references are relegated to small type at the foot of the pages on which they fall alphabetically, in order to economise space.

An *Illustrated Glossary* will be found at the end of the Dictionary.

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DICTIONARY OF PRACTICAL
GARDENING

AN ILLUSTRATED ENCYCLOPÆDIA
OF
PRACTICAL HORTICULTURE FOR ALL CLASSES

EDITED BY

WALTER P. WRIGHT

HORTICULTURAL SUPERINTENDENT UNDER THE KENT COUNTY COUNCIL

Vol. 1.

CASSELL AND COMPANY, LIMITED

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PREFACE.

THE task of writing a preface is usually performed by author or editor with mingled feelings. He is commonly introducing a work which has to run the gauntlet of public opinion, and if he writes his preface with hope, he also does so with fear.

The present instance is somewhat of an exception. CASSELL'S DICTIONARY OF PRACTICAL GARDENING has already had its trial in serial issue, and has been fortunate enough to win public approval in a degree altogether beyond the early expectations of its promoters.

In the permanent volume form which it now assumes it is hoped that its accepted position may become strengthened and consolidated.

The experience of the serial issue has gone in the direction of showing that the original lines laid down for the Dictionary were sound.

These included several points of omission as well as commission. Thus, a bold sweep was made (1) of the derivation of plant names, (2) of the habitats of the different plants, and (3) of the period of introduction of the various species.

Of the first, it was thought that although in a measure interesting, many cases were so absurd that when space was badly wanted for practical matters it was a pity to include them.

Of the second, it was thought that as every important point connected with the culture of the subjects was to be given in the Dictionary, such little practical value as attached to a knowledge of the habitat of the plants could be very well dispensed with.

Of the third, it is perhaps sufficient to say that it is not a practical point at all, and only with such did the work concern itself.

In a word, the object was to save space wherever it could be reasonably saved, and reserve it for practical matters alone.

CASSELL'S DICTIONARY OF PRACTICAL GARDENING deals with upwards of 6,000 genera of plants. Leaving their botanical features severely alone, it concentrates its attention on giving, in the most condensed form consistent with clearness, information on propagation, soil, general culture, and the best species or varieties, adding, in respect to the last, their height, flowering period, degree of hardiness, and the colour of their flowers. With many unimportant genera the matter is concentrated in a paragraph, with others it attains the dignity of an essay.

The language of the Dictionary has been made studiously plain. Its work is done in simple English, almost absolutely. The Glossary at the end of the work will, however, have its interest.

The tangle of plant nomenclature cannot be smoothed out. Garden names are not, in many cases, botanists' names, and thus the name of the garden, the show, and the nurseryman's catalogue is not the name of the botanic garden and the botanical publication. Thousands of plants enjoy the distinction of having a well-recognised garden name as well as a botanical name.

And this is not all. The botanists, not less than the horticulturists, are divided with their names. Thus one plant may have been given different names by different botanists.

I have tried to get out of the formidable difficulty created by this unfortunate condition of affairs by giving the garden name in addition to the botanical name or names

in as many cases as possible. The authority for botanical names is, in the main, that monumental catalogue the *Index Kewensis*. In cases of dispute, the Kew official publications have been made arbitrators.

In the issue of a considerable work, it is often advanced that the names of those responsible for its production may be taken as a sufficient guarantee of its excellence. I do not know how far this may be taken as convincing in a general way, or, if accepted as a principle, whether the horticultural world, which has its own ideas, would allow the claim if advanced on behalf of the editor of, or the principal contributors to, CASSELL'S DICTIONARY OF PRACTICAL GARDENING. It is largely the work of young men. But amongst my helpers are many whose abilities will, I am confident, enable them to make their mark. Amongst those to whom I desire to express acknowledgments for valuable help are Mr. S. Arnott, Mr. E. J. Castle, Mr. John Fraser, Mr. Alexander S. Galt, Mr. George H. Hollingworth, Mr. W. H. Patterson, and Mr. Horace J. Wright.

These gentlemen will, I hope and believe, grow in influence as horticultural workers in the years during which this Dictionary is strengthening its hold as a standard work of reference on practical gardening.

WALTER P. WRIGHT.

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The following are the principal abbreviations used throughout the work. *Height*: ', feet; ", inches. *Months*: Jan., January; Feb., February; Mch., March; Ap., April; My., May; Je., June; Jy., July; Aug., August; Sep., September; Oct., October; Nov., November; Dec., December. *Hardiness*: hdy., hardy; hlf-hdy., half-hardy; grh., greenhouse; st., stove. *Duration or Character*: ann., annual; bien., biennial; per., perennial; shr., shrub; cl., climber; ev., evergreen. *Colour*: bl., blue; crim., crimson; sc., scarlet; wh., white; vio., violet; lil., lilac; pur., purple; yel., yellow; ro., rose; car., carmine; or., orange; br., brown; blk., black. *Miscellaneous*: ord., natural order; syn., synonym; lvs., leaves; var., variety.

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CASSELL'S DICTIONARY OF GARDENING.

An Illustrated Encyclopædia of Practical Horticulture
for All Classes.

*Giving a description, information on Culture, and a selection of Species
or Varieties, of every Plant worth growing.*

ABELIA.

Ornamental, flowering, half-hardy shrubs (*ord.* Caprifoliaceæ) suitable for greenhouse culture. They are hardy in sheltered spots in the south of England. Propagation is by cuttings in summer placed under a frame or bell-glass, and by layers in spring. Equal parts of peat and loam, with a liberal addition of sharp sand, form a suitable compost. May be grown in all peat and sand. When grown as trellis and pot plants for the greenhouse very little, if any, pruning is required, save the removal of stumps.

Principal Species:—

floribunda, 3', Mch., grh., ro. pur.
rupestris, 5', Sep., grh., pk., sweet.
serrata, 3', Mch., grh., red. sweet, ev.
triflora, 5', Sep., grh., sulphur wh., flushed pk.

Other Species:—

spatulata, wh. *uniflora* (*see serrata*).

ABIES (SPRUCE FIR).

Description.—A genus (*ord.* Coniferæ) of ever-green trees, most of them quite hardy. They are naturally spread over the Northern Hemisphere, chiefly in mountainous regions. They arrive very early at maturity, quite small specimens bearing cones freely. The cones are cylindrical, tapering, and erect. The heights given below are those of the trees in their native countries. Economic products, timber and turpentine.

Propagation.—By seeds, cuttings, and layers; chiefly by seeds. (*See also PINUS.*)

Soil.—A good, warm, and well-drained loamy soil will produce the finest specimens.

Other Cultural Points.—These and other Conifers are often poor and unsightly as a result of starvation. Shabby, failing trees may frequently be greatly improved by carefully removing a few inches of the top soil and placing on a coating of fresh soil with manure.

Aaron's Beard, *see Hypericum*.

Aaron's Rod, *see Thapsus*.

Able Tree (*White Poplar*), *see Populus*.

Principal Species:—

amabilis, 180', leaves rather rigid, very dark grn. above, silver wh. on the under surface.
balsamea (*Balm of Gilead*, *Balsam Fir*), from the fragrance of the leaves when young. A favourite with tree planters, 40' to 50'.



Photo: D. S. Fish, Edinburgh.

A FINE DOUGLAS FIR, *PSEUDOTSUGA* (*syn.* *ABIES*) *DOUGLASHII* AT SCONE PALACE, PERTH. ONE OF THE FIRST PLANTED.

brachyphylla, 120', light grn. above with two longitudinal wh. lines beneath.

bracteata, 120', bright grn. above, glaucous on the under surface. The tree is of very slender habit, and is liable to injury by late spring frosts.

cephalonica, 50' to 60', dark grn. and silvery.

concolor, 80' to 150', the yel. bark on the young branchlets is a distinguishing feature (*syns.* lasiocarpa and Parsonii).

firma, 100', very erect growing (*syns.* bifida and homalepis).

grandis, 100', leaves arranged in double rows, silvery beneath. A very quick-growing Conifer.

magnifica, 200', long bright olive grn. leaves. One of the tallest and most stately members of the genus.

nobilis, 200' to 300', sickle-shaped, silvery beneath. One of the best.

nordmanniana, 80' to 100', leaves rigid. One of the most popular of Conifers.

numidica, 40' to 60', dark grn. above, silvery beneath (*syn.* baborensis).

pectinata, 80' to 100', leaves very stiff, turned up at the points. Several vars. are in cultivation.

Pinsapo, 60' to 80' (Spanish Silver Fir). There are several vars., but they are inferior to the type, which is very neat in habit.

Veitchii, 120' to 140', leaves crowded, glaucous above, wh. beneath.

Other Species :—

ajanensis (*Picea ajanensis*)

albertiana (*see* Tsuga

mertensiana).

baborensis (*see* numidica).

bifida (*see* firma).

brunoniana (*see* Tsuga

brunoniana).

canadensis (*see* Tsuga

canadensis).

cilicica, 40' to 60'.

Douglasii (*see* Pseudotsuga

Douglasii).

dumosa (*see* Tsuga bruno-

niana).

Eichleri, 100' (*see* Veitchii).

excelsa (*see* Picea excelsa).

Fortunei (*see* Keteleeria

Fortunei).

Fraseri, 30' to 40'.

hookeriana (*see* Tsuga

hookeriana).

lasiocarpa (*see* concolor).

Mariesii.

mertensiana (*see* Tsuga

mertensiana).

miniata (*see* Picea ex-

celsa).

Morinda (*see* Picea Mor-

inda, *syn.* smithiana).

obovata (*see* Picea obo-

vata).

Parsonii (*syn.* concolor).

Pindrow, 150'.

polita (*see* Picea polita).

religiosa, 100' to 150'.

sachalinensis.

schrenkiana (*see* Picea

obovata).

sibirica, 50'.

smithiana (*see* Picea

Morinda).

subalpina (*see* Picea lasio-

carpa).

Tsuga (*see* Tsuga Sie-

boldii).

webbiana, 160'.

strong fibre. Propagated by seed sown in brisk heat in March ; or by cuttings of the half-ripened wood in April.

Principal Species :—

angusta, 10', Aug., pur. fastuosa, 10', Je., pur.

ABRONIA.

The Sand Verbena. Dwarf-trailing hardy perennials (*ord.* Nyctaginaceæ), with Verbena-like flowers, suitable for the rockery. Of the seven species, four only are generally known. Increased by seeds sown in sandy soil, in a



Photo : D. S. Fish, Edinburgh.

THE HANDSOME FIR COMMONLY KNOWN AS ABIES ALBERTIANA, CORRECTLY TSUGA MERTENSIANA.

frame, in autumn ; the outer skin of the seed should be removed prior to sowing. Also by cuttings of the young growths in spring. Gritty loam, or loam and leaf soil, with sand, suits.

Principal Species :—

arenaria, 9' to 18", Jy., yel., fragrant (*syn.* latifolia).

fragrans, 1' to 2', My., wh., fragrant, opening in the evening. Growth tufted. Seeds produced in this country will not germinate.

Other Species :—

latifolia (*see* arenaria).

mellifera, 6", Jy.

pulchella, 6".

rosea, 6".

umbellata, 6", Ap., My.,

pk. (*syn.* Tricratus ad-

mirabilis).

ABRUS.

An ornamental stove climber (*ord.* Leguminosæ).

ABOBRA.

Stove or greenhouse plants (*ord.* Cucurbitaceæ). Only one species is of any horticultural value. Ornamental Gourds. Propagated by seeds sown in heat in March or April. Equal parts of loam and leaf soil with sand suit the seedlings ; good loam is best in the later stages. Plant out in sunny, sheltered spots after all danger of frost is past. Train the growths to a trellis or a rustic tree stump.

Principal Species :—

viridiflora, flowers grn., fragrant ; fruits small, oval, sc. The tuberous roots may be lifted and stored in winter in a frost-proof place.

ABROMA.

Free-flowering, evergreen stove shrubs (*ord.* Sterculiaceæ) of easy culture. The bark furnishes

Abraxas grossulariata, the Magpie Moth. (*See* Currant and Gooseberry Enemies.)

The roots have purgative properties. Propagated by cuttings under a hand-glass, in heat; and by seeds. Soil, sandy loam.

Principal Species :—

precatorius, 10', flowers pur.; seeds bright sc. and blk. Used by the Buddhists to make rosaries.

ABUTA.

(*Ord.* Menispermaceæ.) About six species are known, none of any value. Stove temperature. Propagated by cuttings inserted in sand, and placed in heat. Soil, loam and peat in equal parts.

Principal Species :—

rufescens, 10', Meh., grey, dark pur. inside.

ABUTILON.

Description.—Evergreen shrubs (*ord.* Malvaceæ) with Vine-like foliage, suitable for pot culture in



PROPAGATING ABUTILONS: A, CUTTING WITH FLOWER BUDS—BAD; B, CUTTING WITHOUT FLOWER BUDS—GOOD.

the greenhouse, as climbers for walls and pillars under glass, and for growing outdoors in the summer. A few species are almost hardy in warm districts.

Propagation.—By cuttings of young wood in the spring and summer in a temperature of 60° (*see* figures); also from seeds sown in the spring over bottom heat.

Soil.—Three parts fibrous loam, two parts peat, and one part silver sand.

Other Cultural Points.—After the cuttings are rooted, remove them to 5" and 6" pots, and when established pinch out the points to induce the plants to break lower down. Give another shift if necessary, pinch the points again, stand the plants where they are fully exposed to light, and syringe freely in the afternoon till flowering commences. As autumn approaches, and the plants show signs of going to rest, lessen the water supply, and maintain a winter temperature of from 40° to 50°. Increase the heat in March, and when growth commences take cuttings, and pot on old plants to form large specimens. For covering wall space, plant strong growing sorts in a bed, and attend to training and stopping, using the syringe regularly to keep red spider in check. Plants for clothing pillars and rafters may be grown in 12" and 14" pots; and under this restriction the vigorous habit is kept in bounds. Feed Abutilons with liquid manure during the flowering season. Young plants raised in the spring form handsome specimens for flower beds in the summer, but they must be lifted and potted before frost appears.

Brief Description of Species.—There are many species, from which the following are selected for brief description :—

aurantiacum, or.
bedfordianum, Nov., vel., red.
esculentum, vel.
floribundum, red.
graveolens, or., red.
insigne, wh., car.
megapoticum, vel., sc.
(*syn.* *vexillarium*).
pæonæforum, Jan., pk.
pulchellum, My., wh.

rufinerve, Aug., vel.
striatum, or., red.
Thompsoni, mottled leaves, much used for flower garden decoration in summer.
venosum, Jy., or., red.
vexillarium (*see* *megapoticum*).
vitifolium, Jy., hdy., wh.

A Selection.—In addition to the species named above, and others, there are numerous hybrids and varieties, some of which are more beautiful than the species. The following are good :—

Boule de Neige, wh.

Delicatum, ro.

Fleur d'or, or.

L'Africain, blood red.

Louis van Houtte, pur.

Queen of the Yellows, vel.

sellovianum marmoratum, mottled foliage.

ACACALLIS.

A small genus (*ord.* Orchidaceæ). *Cyanea* was found by Spruce growing on trees near the Rio Negro. The plants are propagated by root division. They require blocks in a moist, hot structure.

ACACIA.

Description.—Shrubs or trees (*ord.* Leguminosæ) of varying height and habit. The genus is one of the largest in existence, for it numbers nearly 400 species. Some of these are well-known greenhouse plants; a few require stove heat and a con-



ACACIA PULCHELLA.

siderable number are nearly hardy, and will pass through the winter with comparatively little protection. By far the greater number, however, are

Abyssinian Primrose (*see* *Primula boveana*).

not in cultivation, and included in this list are several that were grown fifty years ago when the rage for hard-wooded plants was at its height.

The flowers are usually some shade of yellow or white, very rarely red, and produced in globular heads or cylindrical spikes, each containing many flowers.

The leaves are very variable, and while the feather-cleft (pinnate) leaf may be taken as the type there is a section, known as the Phyllodendrous Acacias, in which the flattened leaf stalks (phyllodes) perform the functions of true leaves. Examples of this peculiarity are to be found in such species as *longifolia*, *platyptera*, and *saligna*.

From a horticultural point of view the most important species are those which hail from Australia, New South Wales, and the temperate regions generally. Economic properties, timber, and the drug catechu from *A. Catechu*.

Propagation.—By cuttings of the tips of the half-ripened wood taken in summer, and placed in very sandy soil under a bell-glass in a cold frame for the greenhouse species, with more heat for the stove forms. By seeds, sown when ripe about 3" deep, also in sandy soil. Temperature from 55° to 60°.

Soil.—A rich compost of equal parts of loam and leaf soil, or peat, with sand, and a little charcoal.

Other Cultural Points.—Temperature for greenhouse species 40° to 50° during winter; in summer as cool as possible. For the stove species 60° to 75°. Firm potting is essential to induce short-jointed, well-ripened wood, but frequent repotting is not necessary. What pruning is required should be done after flowering, when straggling bushes may be cut back well into the old wood. The production of young growth will be favoured by frequent

syringing, and the plants may be stood out of doors towards the end of the summer to ripen their wood. Plenty of water is required at all times, and occasional doses of clear soot water are beneficial. The most troublesome insect enemy is thrips.

Principal Species :—

affinis (*see dealbata*).

armata, 6' to 10', grh.,

yel. One of the most

popular of the Acacias.

cordata, 1' to 1½', yel., a

charming pot plant.

dealbata, The Silver

Wattle, 10' to 25',

spr., grh., yel. flowers

in long racemes. The

cut flowers of this

species are sold under

the name of "Mimosa"

in the London and

other markets. Hdy. in

Devon, the Channel

Islands, etc.

Drummondii, very hand-

some foliage plant, much

used for subtropical

bedding. 10', Ap., grh.,

lemon yel.

juniperina, 6' to 8', Ap.,

grh.; yel. This is an

elegant but rather rare

species, bearing some

general resemblance in

the foliage to verticil-

lata.

leprosa, 6' to 25', Mch.,

Ap., grh., light yel.

This does well when

trained to a pillar, with the young, flowering growths allowed to hang down. Cut back hard after blooming is over.

longifolia, 10', Mch., grh.,

yel.

— *angustifolia*, a very

pretty var., with

longer leaves than the

type.

— *Sophoræ*.

pubescens, 6' to 15', Ap.,

grh., pale yel. This

plant is charming at

all seasons, for the

feather-like leaves are

very elegant.

pulchella, 3' to 5', Mch.,

Ap., grh., rich yel. A

charming species for pot

work. It flowers freely

each year if the wood is

well ripened.

riceana, 20', My., grh.,

yel. Graceful weeping

habit.

urophylla, 10', Ap., grh.,

wh., scented.

verticillata, 6' to 20',

Mch., grh., yel.



ACACIA VERTICILLATA.

ACACIA JUNIPERINA.

ACACIA ARMATA ANGUSTIFOLIA.



ACACIA VERTICILLATA.

Other Species :—

- albicans, 5', wh. (Pithecolobium albicans).
 amcena, 4', My., grh., yel.
 arabica (gum arabic), 20', grh., wh. (*syn.* vera).
 argyrophylla (*see* brachybotrya).
 baileyana, grh., yel.
 Benthani (*see* cochlearis).
 brachybotrya, 8', Ap., grh., yel.
 Catechu, 20' to 40', st., yel.
 cavema, 20' (*see* farnesiana).
 cochlearis, 4', My., grh., yel.
 cultriformis, 4', Ap., grh., yel.
 cuneata, Ap., grh., yel.
 cyanophylla, 18', grh., yel.
 decurrens, 10' to 20', Jy., grh., yel.
 diffusa, 2', My., grh., yel.
 farnesiana, 10' to 20', st.
 glauca, 5' to 10' (*see* Leucaena glauca).
 glaucescens, 6' to 10', My., grh., yel. (*syn.* homomalla).
 grandis (*syn.* pulchella grandis).
 heterophylla, 5', My., grh., yel.
 hispidissima (*syn.* pulchella hispidissima).
 holoserica, 10' to 20', Ap., grh., yel. (*syn.* leucophylla).
 homomalla (*see* glaucescens).
 Huegelii, Feb., grh., yel.
 Lebbek, 20' (*see* Albizzia Lebbek).
 leucophylla (*see* holoserica).
 linearis, 3' to 6', My., grh., yel.
 longissima (*see* linearis).
 lunata, 3', Ap., grh., yel.
 melanoxydon, 6' to 10', grh., yel.
 mollissima (*see* decurrens).
 oleafolia (*see* lunata).
 Oxycedrus, 6' to 10', My., grh., yel.
 paradoxa, 6' (*see* armata).
 penninervis, 5', My., grh., yel.
 platyptera, 3', Mch., grh., yel.
 saligna, 6' to 10'.
 Senegal, 20', st., wh.
 spadigera, 3' to 5', st., yel.
 sphaerocephala, st., yel.
 uncinifolia, 6', Ap., grh., yel.
 vera (*see* arabica).
 vestita, 4', Je., grh., yel.
 viscidula, 6'.



ACACIA PUBESCENS.

ACÆNA.

Trailing plants (*ord.* Rosaceæ) suitable for rock-work or carpeting; leaves finely divided and frequently beautifully tinted. Flowers in summer; mostly in globular inconspicuous heads. About thirty species known; those named are hardy in most gardens. Propagated by division and cuttings in autumn or spring; also by seeds in spring. Almost any soil will do; moist and peaty preferred.

Principal Species :—

- argentea, 1" to 3", foliage bronzy, flowers greenish.
 microphylla, 1" to 2", foliage bronzy grn., flowers with bright crim. spines. Perhaps the best.
 myriophylla, 5" to 10", Fern-like leaves, flowers greenish.

Other Species :—

- adscendens, 3".
 Buchananii, 2", pea grn. leaves.
 ovalifolia, 9".
 Sanguisorbea, 4".

ACALYPHA.

Stove ornamental foliage plants (*ord.* Euphorbiaceæ). About 100 species, of easy culture. Indica has laxative properties. Increased by cuttings of points of the shoots, inserted in a close frame in a brisk heat at any time. Equal parts of loam and leaf soil, with sand, are suitable. The most useful specimens are those with single stems. Continual propagation is necessary to keep up a stock of these. Leggy old plants are of little use. Plenty of water is needed at all times, with liquid manure in summer. Thrips (*see* THRIPS) is the chief enemy.



ACACIA LONGIFOLIA.

Principal Species :—
hispidia, 7' to 10', sum., crim. The long drooping spikes of flowers are very ornamental.



ACAULIA LEPROSA. (See page 4.)

musaica, leaves grn., or., and dull red. This is a most useful plant for table decoration, and it is also suitable for subtropical bedding.
sanderiana (see hispidia).

Other Species :—
godseffiana, 1' to 3', My., marginata.
leaves grn. torta.
indica, tricolor (syn. wilkesiana).
macafeeana, — marginata.
macrophylla, wilkesiana (see tricolor).

ACAMPE.

A genus of epiphytic Orchids (ord. Orchidaceæ) common to India and China, and allied to Vanda. Longifolia is the only species of note. They require a stove temperature.

ACANTHEPHIPIUM.

Stove terrestrial Orchids (ord. Orchidaceæ) of no great horticultural value. Propagated by division of the pseudo-bulbs when growth commences. A mixture of sandy peat, broken crocks, and charcoal suits them.

Principal Species :—
bicolor, 9'', Je., pur., yel. javanicum, 1½'', Sep., yel.,
Curtisii, light ro., spotted red.
pur. mantinianum, 9'', yel., red.
eburneum, 9'', wh. striatum, 9'', Je., wh.
sylhetense, 9'', Je., wh.

ACANTHOLIMON (SEA LAVENDER).

Dwarf, hardy evergreens (ord. Plantaginaceæ), distinguished by their stiff, sharp-pointed leaves. The flowers are similar to those of Statice and Armeria. Suitable for the rockery. Propagated by

Acanthodium (see Blepharis).

seeds sown in warm sheltered spots; they germinate slowly; also by cuttings in late summer, and by division. Light sandy soil, warm, and well drained.

Principal Species :—
acerosum (syn. Statice Kotschy, sum., wh., rare.
acerosa). venustum, 6'' to 8'', sum.,
glumaceum, 6'', sum., ro. ro.

ACANTHOMINTHA.

A half-hardy annual (ord. Labiatæ) of no great value. May be treated like Nemesias.

Species :—
ilicifolia, Jy., pur., yel., wh.

ACANTHONEMA.

A stove genus (ord. Gesneraceæ) of little cultural importance, propagated by seeds, and thriving in sandy loam if given shade and moisture.

Species :—
strigosum, 6'', My., pur.

ACANTHOPHÆNIX.

Stove Palms (ord. Palmæ) with thorny stems, thriving in loam three parts, peat and leaf mould one part each, and a little sand. Propagated by seeds.

Species :—
crinita. rubra.

ACANTHORHIZA.

Stove Palms (ord. Palmæ), allied to Trithrinax, but differing in having the aerial roots hardening into spines and the blade of the leaf divided. Propagated by seeds sown in brisk heat, preferably in spring. Soil, good fibrous loam with a little sand.

Principal Species :—
aculeata, the trunk is Chamærops stauracan-
covered with a net- tha).
work of spines (syn. Wallisii.
Warszewiczii.

ACANTHOSTACHYS.

A genus of stove evergreen herbaceous plants (ord. Bromeliaceæ). Of little horticultural value. Propagation by suckers. Strobilacea is 4' high.

ACANTHUS.

Herbaceous plants (ord. Acanthaceæ) of striking effect in borders or on grass. They produce long spikes of flowers, and have very ornamental foliage. All hardy except those marked greenhouse or stove, and recommended for gardens where subtropical effect is desired. Propagated by division of roots in early autumn or spring, or seeds sown in slight heat in spring. They attain perfection in good soil and a sunny position, although they also grow in shade.

Principal Species :—
longifolius, 4', Je., pur., ro.; leaves 2' long.
lusitanicus, 5', Jy., wh. or pk.; leaves heart shaped; warm situation (syns. latifolius, mollis latifolius).
mollis, 4', Jy., wh. or pk., resembles preceding but is not so fine.
spinous, 4', Jy., pur.; leaves deeply cut, spiny.
— spinosissimus, 4', Aug., flowers ro.

Other Species :—
candelabrus, 3', Jy., pur. Caroli-Alexandri, 2', Jy.,
carduifolius, 3', Aug. rosy.
grh., bl. (see Blepharis hirsutus, 2½', Jy., ro.
carduifolia). montanus, st., ro.
niger, 3½', Jy., pur.

ACER (MAPLE).

Description.—A genus of trees (*ord.* Sapindacæ), principally deciduous, numbering about fifty species, nearly all hardy in our climate. They are valued for plantations, shrubberies, or ornamental planting. The flowers are generally greenish in colour, and the trees are prized for their foliage, which is usually very handsome. For garden purposes the varieties of japonicum, when small, and of palmatum, are the most useful, either for the grounds or in pots for decorative effect. The forms of the latter are very varied and beautiful. Sugar is obtained from several of the North American Maples.

Propagation.—By layers, grafting, budding, seeds, and cuttings of some species. Seeds of the scarcer species should be sown under glass.

Soil.—A good, well-drained loam is suitable for the greater number of the Acers, but a few, such as rubrum, prefer a marshy soil.

Other Cultural Points.—Japonicum and palmatum, when grown in the open, should be sheltered from cold winds; in some districts where late frosts occur it may be necessary to protect with a covering of some kind. Negundo should have a sheltered position. When in pots they ought to receive an occasional shift or have fresh soil added. They should also be hardened off and placed outside to ripen their wood before forcing anew.

Principal Species :—

campestre, Common Maple, 20', small leaves, with five toothed divisions (lobes). Campestre austriacum (*syn.* austriacum) is a fine tree with larger leaves. There are several others, including both silver and golden margined forms.

dasy carpum, Silver Maple, 40', leaves five lobed; bark flaky (*syns.* eriocarpum, tomentosum, virginianum, and saccharinum).

glabrum, Rocky Mountain Maple, 30', leaves three to five lobed, light grn. (*syns.* Douglasii and tripartitum).

japonicum, 20', red. leaves many lobed. There are several varieties of this valuable Maple, among them being macrophyllum (of gardens) and vitifolium.

macrophyllum, 60', leaves hand shaped (palmate). A handsome tree.

Negundo, 40'. This tree is best known by its form with silver variegated leaves, which is very beautiful in pots or in the open. That with yellow variegation is not so pretty, but rather hardier (*syns.* Negundo aceroides and N. fraxinifolium).

opulifolium, 8', leaves heart shaped, five lobed. A neat Maple (*syns.* Opalus, italicum, italum, and rotundifolium).

palmatum, 20' leaves palmately divided into from five to seven toothed lobes (*syn.* polymorphum). The popular Japanese Maple, now largely used for the decoration of the garden or for growing in pots for the conservatory or house. There are a number of forms which have for convenience been included in the following groups: Palmatum, Septemlobum, and Dissectum. These have a number of synonyms; all are beautiful.

pictum, 18', leaves with five to seven entire lobes. There are three useful varieties, named marmoratum, rubrum, and variegatum.

platanoides, Norway Maple, 50', leaves five lobed, heart shaped, with acute teeth. A well-

Avars. Mites. The most troublesome is *tellarius*, for which see *Red Spider*.

known ornamental tree. Of the varieties, aureo-variegatum, variegatum, multicolor, Schwedleri, and laciniatum may be named.

Pseudo-platanus, Sycamore, 60'. A very hardy, well-known tree. Among its vars. are albo-variegatum, flavo-variegatum, purpureum, and Leopoldii.

rubrum, Scarlet Maple, leaves heart shaped, five lobed, and toothed. Useful for moist places. Two vars., Drummondii and sanguineum, are also grown.

Other Species :—

circinatum, 6'.
cissifolium, 10' (*syns.* Negundo cissifolium, N. nikoense).

cratægifolium, 10'.
creticum, 4'.
diabolicum (*syn.* pulchrum).
Heldreichi.

heterophyllum, 4' (*syns.* microphyllum, obtusifolium, and orientale).

hyrcanum (*syns.* caucasicum, ibericum, and italum var., hyrcanum).
insigne (*syn.* velutinum).
monsessulanum, 20' (*syn.* heterophyllum, etc.).
nikoense (*syn.* Negundo nikoense).

obtusatum (*syn.* hybridum).

pennsylvanicum, 20' (*syns.* canadense, hybridum, and striatum).

rufinerve, and var. albolimbatum.

saccharinum, 40' (*syns.* barbatum, saccharophorum, and Saccharum).

spicatum, 18', My. (*syns.* montanum and parviflorum).

tataricum, 20' (*syn.* cordifolium). Var. Ginnala is more elegant.

Van Volxemii (*syn.* Trautvetteri).



Photo : D. S. Fish, Edinburgh.

A SMALL SPRAY OF ACER NEGUNDO VARIEGATA.

ACERAS.

Terrestrial Orchids (*ord.* Orchidacæ). Propagated by division of the tubers, and liking chalky loam. Anthrophora (the Green Man Orchis), 1', June, flowers greenish, on tall spikes, is found only on dry chalky pastures in S.E. Britain.

ACERATIUM.

A stove evergreen tree, allied to Elæocarpus and



ACER PLATANOIDES VARIETY.



ACER RUBRUM.



ACER DASYCARPUM.



ACER PALMATUM SANGUINEUM.

SOME BEAUTIFUL MAPLES. (See p. 7.)

Tilia (ord. Tiliaceæ). It likes a compost of loam and peat, and is propagated by cuttings of the ripe wood placed in a warm propagating frame.

Species:—

oppositifolium, 20', Je.

ACHILLEA. (MILFOIL.)

Border and Alpine flowers (ord. Compositæ), which are prized for effect or for cutting. Flowers, mostly small, arranged in corymbs. Leaves finely divided in the greater number. Propagated by division of roots in spring or autumn, cuttings, and seeds sown in the open or under glass. Any ordinary soil. The greater number thrive in sun or shade, though they prefer the former. Some are of rampant growth and increase quickly by underground runners, which must be prevented from encroaching on other plants.

Principal Species:—

ageratifolia, 6', Je., wh., Daisy-like, leaves finely toothed and white. A charming little Alpine delighting in dry sandy loam (*syn.* *Anthemis Aizoon*).

atrata, 5', wh., leaves deep grn.

Clavennæ, 9' to 12', My., etc., wh., leaves hoary in appearance.

filipendulina, 5', Je. onwards, yel., leaves rough and fern-like. A noble plant for the back of the border (*syns.* *filipendula* and *Eupatorium*).

Millefolium, 2', sum. and aut. The var. called *roseum*, or *rubrum*, is worth growing for cutting or effect. The type is the well-known Milfoil.

Ptarmica, 2', sum. and aut., wh. The double vars. are indispensable; the best are *Pearl* and *The Bride*. The type is the wild "Sneezewort." *sibirica*, 1½', Jy., wh. A graceful border plant, best known by its synonym of *mongolica*.

tomentosa, 6' to 9', sum., yel., leaves woolly. A bright little flower for rockery or front of border. *Tournefortii*, 2', sum., yel., in flat heads, leaves silvery. A handsome border plant, a little tender (*syn.* *ægyptiaca*, but *filipendulina* is sometimes known by this *syn.* also).

Other Species:—

<i>Ageratum</i> , 8', sum., yel.	<i>nobilis</i> , 2', sum., wh.
<i>decolorans</i> , 1', Jy., pale yel.	<i>rupestris</i> , 9', My., grn.
<i>micrantha</i> , 1½', Jy., yel.	<i>setacea</i> , 1', Jy., wh.
<i>moschata</i> , 6', Je., wh.	<i>umbellata</i> , 5', Je., wh.

ACHIMENES.

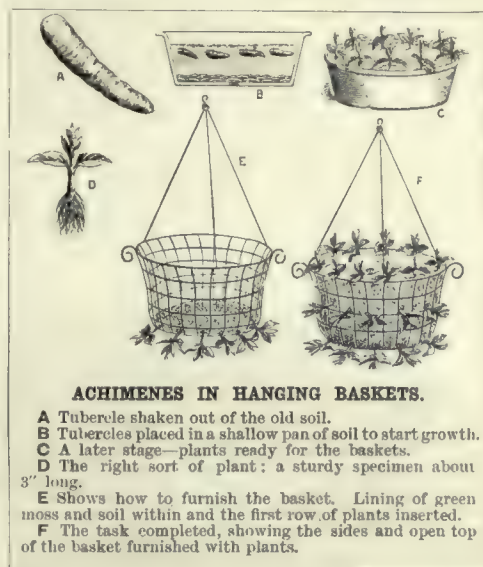
Description.—A genus (ord. Gesneraceæ) composed of stove and greenhouse herbaceous perennials, flowering in the summer, and suitable for growing in pots, pans, and hanging baskets. The plants form scaly tubercles at the root, which rest dormant through the winter. Many beautiful hybrids have been obtained by crossing the different species.

Propagation.—Chiefly from the scaly tubercles which form at the roots; also from seeds and cuttings.

Soil.—Three parts fibrous loam, two parts leaf mould, one part decayed manure, half a part silver sand.

Other Cultural Points.—Commence to start a portion of the tubercles about the end of January, but leave the remainder for another month if a succession of bloom is required. Shake the old soil away, select the largest tubercles and place them in shallow pans (*see figure*), using sifted soil of the character suggested, but leaving out

the manure. Plant the smallest tubercles in other pans to increase in size. Place the tubercles 1" apart, and cover with ½" of soil. A humid temperature of from 60° to 70° is suitable, and when growth appears place the pans near to the light. When the plants are 3" high they will be ready for their flowering pots, which may vary in size from 7" up to 12", according to the purpose required. Deep pans are also suitable. Fill the pots with soil to within 2" of the rim, lift the plants carefully, and transplant them about 2" apart. Continue to grow in a warm temperature, water freely, and give liquid manure when flowering commences. At this stage they may be removed to a cooler house. For hanging in conservatories and other places baskets of *Achimenes* are very effective. Line the bottom of a galvanised iron



ACHIMENES IN HANGING BASKETS.

- A** Tubercle shaken out of the old soil.
B Tubercles placed in a shallow pan of soil to start growth.
C A later stage—plants ready for the baskets.
D The right sort of plant: a sturdy specimen about 3" long.
E Shows how to furnish the basket. Lining of green moss and soil within and the first row of plants inserted.
F The task completed, showing the sides and open top of the basket furnished with plants.

wire basket with moss, green side outwards, and insert a ring of plants, 2" apart, and pointing outward through the basket (*see figure*). Line the basket for a further 2"; add more soil, insert another ring of plants, and so on till the top of the basket is reached. Plant the surface also, and hang the baskets in a warm temperature till flowering commences, when they may be removed to cooler structures. After the flowering is over, and the foliage turns yellow, gradually withhold water, and when the stems are dead cut them down and store the tubercles in the soil for the winter, with a temperature of about 50°. During the growing period *Achimenes* are liable to attacks of red spider, which may be kept in check by a free use of the syringe on favourable occasions.

The plants greatly dislike a dry atmosphere, and amateurs frequently fail with them because during long absences (often unavoidable) on the part of the cultivator on dry, hot days, the sun parches the atmosphere, which becomes harsh and arid. It is difficult, in many cases, to meet this difficulty, but an effort should be made, as baskets 2' or more through, completely smothered with brilliant flowers, are objects of rare beauty.

Brief Description of Species :—

amabilis (see *Nægelia multiflora*).
 atrosanguinea (see *foliosa*).
 candida (see *Dicyrta candida*).
 coccinea, Aug., sc.
 — major, a good large var.
 cupreata (see *Episcia cupreata*).
 Escherii, Je., pur. crim.
 floribunda elegans, Oct., pur. crim.
 foliosa, Aug., crim.
 formosa, Sep., ro.
 gloxiniaeflora (see *Gloxinia glabrata*).
 grandiflora, 1½', Oct., crim.
 heterophylla, Jy., sc.
 hirsuta, 2½', Sep., ro.
 intermedia, 1', Aug., sc.
 Jayi, Je., pur.
 Liebmanni, 1½', Jy., crim.
 longiflora, 1', Aug., vio.
 — alba, wh.
 — major, vio.
 magnifica (see *Locheria magnifica*).
 margarita, wh.
 Mountfordii, Aug., sc.
 multiflora, 1', Oct., lil.
 ocellata (see *Isoloma*).
 patens, 1', Je., vio.
 pedunculata, 2', Je., sc., yel.
 picta (see *Isoloma*).
 rosea, 1½', Jy., ro.
 Skinneri (see *hirsuta*).
 splendens, vio.
 venusta, 1½', pur.
 Verschaffeltii, wh.

A Selection.—The number of species and hybrids of *Achimenes* is so great that a select list, embracing a considerable diversity of colours, can hardly fail to be useful. The following may be relied on :—

Advance, reddish pur.	Dazzle, sc., yel. eye.
Ambrose Verschaffelt, wh.	Hendersonii, or.
Carminata splendens, ro.	Mauve Queen, mauvé.

ACINETA.

Cool-house, sub-terrestrial Orchids, closely related to *Peristeria* (ord. Orchidaceæ). Propa-

gated by division of the pseudo-bulbs and by seeds. Equal parts of sphagnum moss and fibrous peat. Give plenty of water, and syringe during the growing season. Very little water is needed when they are at rest. The *Odontoglossum* house suits them well.

Principal Species :—

Barkeri, 2', My., yel., crim., fragrant.	Humboldtii, 2', My., dk. crim. (syn. <i>Anguloa superba</i>).
chrysantha, 2', My., yel.	

Other Species :—

Arcei, yel.	sulcata, yel.
densa, 1½', Oct., yel., red speckled.	

ACIOTIS.

A small genus of stove evergreens (ord. Melastomaceæ), with small but pretty flowers. Propagated by cuttings of the young wood taken in spring and placed in heat. Soil, a mixture of loam and peat, with sand.

Principal Species :—

aquatica, 9", Je., wh., red.	discolor, 1', Je., wh., red.
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The pots should be stood in pans of water.

ACIPHYLLA.

Hardy perennials (ord. Umbelliferae), more curious

Achras (see *Sapota*).

Achyranthes Verschaffeltii (see *Iresine Herbstii*).

Acinos (see *Calamintha*).



ACHIMENES VERSCHAFFELTII FORMING A BEAUTIFUL HANGING BASKET.

than valuable, suitable for the rockery. The soil should be light and sandy. Propagation may be effected by seeds or division in spring.

Principal Species :—

Colensoi, 6', wh. squarrosa, the Bayonet
Lyalli, 6', wh. Plant, 6', wh.

ACIS (SNOWFLAKE).

Description.—Charming little bulbous plants (*ord.* Amaryllidaceæ), recognised by modern botanists as only a sub-genus of *Leucojum*, but referred to now under the garden name for convenience of reference. The leaves are narrower, and the flowers smaller than those of the other *Leucojums*, such as *vestitum* and *vernum*.

Propagation.—By offsets, taken off when the leaves become yellow; or by seeds sown in pans or pots and placed in a cold frame.

Soil.—Light and sandy, with the addition of peat or leaf soil.

Other Cultural Points.—The rock garden or a frame is the best place for the majority, though *autumnalis* will thrive in the border. *Trichophylla* and *rosea* ought to be grown in pure sand, in a frame or in pots in a cold greenhouse. They require plenty of water.

Principal Species :—

autumnalis, 6'', Aug., wh. The most useful of all; exquisite satin-like flowers, tinged with ro. at the base (*syn.* *Leucojum autumnale*).

longifolia, 6'', My., wh. (*syn.* *Leucojum longifolium*).

rosea, 4'', Sep., ro. red (*syn.* *Leucojum roseum*).

tingitana, 1', Ap., wh. (*syn.* *Leucojum tingitanum*).

trichophylla, 6'' to 1', Ap., wh. (*syn.* *Leucojum trichophyllum*).

ACISANTHERA.

(*Ord.* Melastomaceæ.) *Quadrata*, the chief species, is of no garden value. It does well in a mixture of peat, loam, and sand. 18'', July, purple.

ACMADENIA.

A small genus (*ord.* Rutaceæ) of rather pretty but uncommon greenhouse shrubs. *Tetragona* is the best known species. It requires peat and sand, with a little loam. Cuttings strike readily in a cool frame. 1' to 2', June, white.

ACMENA.

Greenhouse evergreen shrubs (*ord.* Myrtaceæ) with small flowers and pretty berries. A compost of equal parts of peat, loam, and sand will suit them. Cuttings of the half-ripened wood will strike in a cool house.

Principal Species :—

floribunda, 4', My. to Sep. Flowers wh., berries pur.

ovata, dark pur. leaves and stems.

ACOKANTHERA.

Greenhouse shrubs, poisonous. May be propagated by cuttings, and succeed in loamy soil.

Principal Species :—

spectabilis, 10', spr., wh. (*syn.* *Toxicophlœa spectabilis*).

venenata, 6', wh. (*syn.* *Toxicophlœa Thunbergii*).

ACONITE, WINTER.

The Winter Aconite (*Eranthis hyemalis*) is one of the earliest of our hardy flowers, and ought to be largely planted where such plants are appreciated.

Its little golden yellow flowers, surrounded by their ruff of green leaves, the whole making a plant often less than 6'' high, are welcome at the early season—December to March—at which they appear.

It does well in the border or in grass, but forms a capital subject for planting in shady, moist woods. Propagated by seeds, sown at any time, or by division. Rich soil. *Cilicica* blooms in April, and has deeper coloured flowers. (*See also* *ERANTHIS*.)

ACONITUM. (MONKSHOOD, WOLF'S-BANE.)

Description.—Showy hardy flowers (*ord.* Ranunculaceæ) for the back of the border, or among shrubberies or "wild gardens." Flowers in racemes on tall stems, the upper parts of the flowers being helmet shaped. All the parts are poisonous, and roots should not be left where animals can have access to them.

Propagation.—By division of roots, and by seeds, the latter being sown in spring, or when ripe.

Soil.—The *Aconitum* likes a strong soil, but it will thrive in almost any kind, provided that it is not too dry.

Other Cultural Points.—It is very suitable for growing in borders shaded by walls or overhanging trees, if the latter are not allowed to rob it of food. Under trees plenty of water should be given in dry weather. The plants must be staked and tied as they make growth, unless in sheltered places.

Principal Species :—

Anthora, 2', Jy., pale yel. A pretty species where a tall plant is not desired. There are several vars. all with yel. flowers.

Fischeri, 4', Jy., bl. pur. A useful species for the back of the border. A var. named *acutum* is equally useful (*syn.* *autumnale*).

Lycocotum, 4', Jy., yel. A good border plant. There is a conflict of authorities regarding the colour of this plant; it is pur. according to some, but one with yel. flowers has this name in gardens. The pur. species is probably *moldavicum*.

Napellus, 4', Jy., bl. A handsome but poisonous species, well known as the common Monkshood. There are several vars. under a great many names, but the best of these is the white form, known as *album*, useful as a contrast. Long grown and widely distributed over the northern hemisphere.

paniculatum, 3', Je., Sep., vio. A good species. *variegatum*, 1½' to 5', Jy., bl. The form called *bicolor*, which has bl. and wh. flowers, is the best. There is also a wh. variety called *albiflorum*.

Other Species :—

acuminatum, 2' to 4', Jy., flaccidum, 6', Jy., Aug., pur. vio.

album, 4' to 5', Aug., Fortunei, 6', Je., bl. (*syn.* wh. chinense).

ampliflorum, 2' to 3', Je., heterophyllum, 2½', Aug., pur. yel.

angustifolium, 2' to 3', japonicum, 6', Aug., flesh. Je., bl. — cœruleum, bl.

biflorum, 1', Je., bl. laciniatum, 3', Je., bl.

Cammarum, 4', Sep., pur. maximum, 6', Jy., bl.

cernuum, 3' to 4', Jy., vio. melocotum, 2' to 4', Jy., cream.

delphinifolium, 6'' to 2', Je., pur. Meyer, 2' to 4', Je., pur.

elatum, 3' to 4', Je., bl. moldavicum, 5', Aug. pur.

eminens, 2' to 4', Je., bl. eriostemon, 4', Je., pur. molle, 2' to 6', Je., vio.

exaltatum, 6', Jy., bl.

Aconiopteris (*see* *Acrostichum*).

Aconitias (*see* *Xanthosoma*).

orientale, 3', Jy., yel. (*syn.*

ochroleucum).

rostratum, 1' to 2', Je., vio.

Schleicheri, 2' to 3', sum.,

vio.

Sprengeli, 3' to 4', Je.,

pur.

tauricum, 3' to 4', Je., bl.

tortuosum, 6', Jy., vio.

uncinatum, 6', Jy., lil.

[The nomenclature of this genus is very confused, and there are a number of other species or varieties of more or less value—chiefly less.]

ACORUS.

Hardy herbaceous plants (*ord.* Aroidæ) with sword shaped leaves. Aquatics, or sub-aquatics, useful for the margins of streams and lakes. Propagated by divisions of the rhizome in spring.

6,150 yds.; North Wales, 3,240 yds.; Westmorland, 6,760 yds.; and Wiltshire, 3,630 yds.

ACRIDOCARPUS.

(*Ord.* Malpighiaceæ.) The species *natalitius* is a yellow summer-flowering climber, suitable for a warm house, thriving in loam and sand, and propagated by cuttings.

ACRIOPSIS.

Epiphytal Orchids (*ord.* Orchidaceæ) thriving in a stove temperature.

Principal Species :—

densiflora, grn., pk.

javanica, wh., grn., pur.



Photo : E. J. Wallis, Putney, S.W.

ACROSTICHUM CRINITUM (see next page).

Principal Species :—

Calamus, the Sweet Flag, 3'. Flowers yel., inconspicuous; leaves tall, bright grn., very strongly fragrant when bruised. The root also is fragrant. There is a var. with golden striped leaves.

gramineus, much smaller in all its parts than *Calamus*. There is a pretty variegated form of this species.

ACRADENIA.

A genus of greenhouse evergreen shrubs (*ord.* Rutaceæ) requiring a compost of loam and leaf soil, and propagated by seeds and cuttings. *Frankliniæ* has white flowers and fragrant leaves.

ACRE.

The English statute acre contains 4 roods, or 160 sq. rods, poles, or perches, or 4,840 sq. yds.; but the size of the acre varies locally. Thus the Cheshire acre is 10,240 yds.; the Cornish, 5,760 yds.; Cunningham, 6,250 yds.; Derby, 9,000 yds.; Devonshire, 4,000 yds.; Herefordshire, 3,226½ yds.; Irish, 7,840 yds.; Leicestershire, 2,308½ yds.; Scotch,

ACROCLINIUM.

Pretty half-hardy annuals (*ord.* Compositæ) with "everlasting" flowers, pretty in the garden; in pots under glass; and prized as cut flowers for drying for winter use. For this purpose the Daisy-like flowers should be cut before they open, and hung, head downwards, in a dry place. Sow in pots or boxes under glass in March or April, and plant out afterwards, or sow in the open in June. For winter bloom under glass sow in August. The soil should be light and sandy. Choose a place in full sun, and do not plant out until danger from frost is over. Correctly referred to *Helipterum*.

Principal Species and Varieties :—

The only species in cultivation at present is *roseum*, 1' to 2', ro. The best vars. are *album*, wh.; *grandiflorum*, ro.; and *album fl. pl.*, double wh. (see *Helipterum roseum*).

ACROCOMIA.

A genus of about eleven species of South American Palms (*ord.* Palmæ), having tall (20' to

50'), prickly trunks. A warm greenhouse is needed, and a rich sandy loam, with plenty of water at all times. Propagation is by suckers.

Principal Species :—

sclerocarpa (hard fruited) (*syns.* *aculeata* and *Cocos fusiformis*).

Other Species :—

cubensis, *fusiformis*, *globosa*, *guianensis*,
horrida, *lasiospatha*, *minor*, *tenuifolia*.

ACRONYCHIA.

A greenhouse evergreen shrub (*ord.* *Rutaceæ*), with a Rue-like appearance. *Cunninghamii*, 7', needs ordinary greenhouse treatment. Propagation is by cuttings, taken in July, and placed in sand in a close frame.

ACROPHYLLUM.

Dwarf greenhouse shrubs (*ord.* *Saxifragaceæ*), propagated by cuttings of the half-ripened shoots, placed in a cool house, and covered with a bell-glass; they thrive in fibrous peat two-thirds, loam one-third, and a little sand. Thorough drainage is essential.

Only Species :—

venosum, 6', My., pk., wh. (*syn.* *verticillatum*).

ACROSTICHUM.

Description.—A genus of almost wholly tropical Ferns (*ord.* *Filices*), showing great variation in the size of the plants and cutting of the fronds. Including *Aconiopteris*, *Chrysodium*, *Egenolfia*, *Elaphoglossum*, *Gymnopteris*, *Hymenolepis*, *Olfersia*, *Photiopteris*, *Polybotrya*, *Rhipidopteris*, *Soromanes*, *Stenochlæna*, and *Stenosemia*.

Propagation.—By spores, and division of the rhizomes in some cases.

Soil.—Peat two-thirds, loam one-third, with sand, sphagnum, and charcoal.

Other Cultural Points.—Plenty of water at all times. Stove temperature, except in a few cases.

Principal Species :—

[NOTE.—The figures in this genus refer to the length of the fronds.]

acuminatum, 1' to 2' (*syn.* *Polybotrya acuminata*).

apiifolium, 2" to 6" (*syn.* *Polybotrya apiifolia*).

apodum, 1' (*syn.* *Elaphoglossum apodum*).

appendiculatum, 6" to 18" (*syn.* *Egenolfia appendiculata*).

aureum, 2' to 6', a sub-aquatic species (*syn.* *Chrysodium aureum*).

auritum, 1½' to 2' (*syn.* *Stenosemia aurita*).

canaliculatum, 2' to 3' (*syn.* *Polybotrya canaliculata*).

cervinum, 2' to 4' (*syn.* *Olfersia cervina*).

crinitum, 4" to 18" (*syn.* *Chrysodium* and *Hymenodium crinitum*) (*see* page 12).

foeniculaceum (*syn.* *Rhipidopteris foeniculaceum*).

latifolium, 9" to 18" (*syns.* *Elaphoglossum latifolium* and *A. callæfolium*).

peltatum, 2" to 6" (*syn.* *Rhipidopteris peltata*).

quercifolium, 3" to 4" (*syn.* *Gymnopteris quercifolia*).

scandens, 1' to 3' (*syn.* *Stenochlæna scandens*).

subrepandum, 1' to 2' (*syn.* *Gymnopteris subrepanda*).

tenuifolium, 3' to 5' (*syns.* *meyerianum* and *Stenochlæna tenuifolia*).

Other Species :—

alienum, 1' to 2' (*syn.* *Gymnopteris aliena*).

axillare, 6" to 18" (*syn.* *Chrysodium axillare*).

barbatum (*see* *scolopendrifolium*).

bifurcatum, 3" to 4" (*syn.* *Polybotrya bifurcata*).

blumeianum, 1' to 3' (*syn.* *Chrysodium blumeianum*).

callæfolium (*see* *latifolium*).

caudatum (*see* *petiolosum*).

conforme, 2" to 9" (*syn.* *Elaphoglossum conforme*).

cyliudricum (*see* *osmundaceum*).

dombeyanum (a var. of *lepidotum*).

Hermieri, 1½' to 3' (*syn.* *Elaphoglossum Hermieri*).

heteromorphum, 1½" to 2" (*syn.* *Elaphoglossum heteromorphum*).

Langsdorffii (*see* *muscosum*).

lepidotum, 3" to 6" (*syn.* *Elaphoglossum lepidotum*).

longifolium (*see* *latifolium*).

meyerianum (*see* *tenuifolium*).

muscosum, 6" to 12", grh. (*syn.* *Langsdorffii*).

Neitneri (*see* *quercifolium*).

nicotianæfolium, 1' to 3'

(*syn.* *Gymnopteris nicotianæfolium*).

osmundaceum, 2' to 3' (*syns.* *cyliudricum* and *Polybotrya osmundacea*).

paleaceum (*syn.* *squammosum*).

petiolosum, 2' to 4' (*syns.* *caudatum* and *Polybotrya caudata*).

piloselloides (*see* *spathulatum*).

platyrhynchos, 12" to 16" (*syn.* *Hymenolepis platyrhynchos*).

scolopendrifolium, 1' (*syn.* *barbatum*).

serratifolium, 2' to 2½' (*syn.* *Chrysodium serratifolium*).

simplex, 4" to 12" (*syn.* *Elaphoglossum simplex*).

sorbifolium, 12" to 18" (*syn.* *Stenochlæna sorbifolia*).

spathulatum, 2" to 4" (*syn.* *piloselloides*).

spicatum, 6" to 18" (*syn.* *Hymenolepis brachystachys*).

subdiaphanum, 4" to 8" (*syn.* *Aconiopteris subdiaphana*).

taccæfolium, 1' to 2' (*syn.* *Gymnopteris taccæfolia*).

trilobatum (a var. of *taccæfolium*).

villosum, 6" to 9".

viscosum, 6" to 12".

ACROTREMA.

Stove evergreens (*ord.* *Dilleniaceæ*) of no cultural importance. *Walkerii*, yellow, flowers in June.

ACROTRICHE.

A genus (*ord.* *Epacridæ*) comprising eight or nine dwarf evergreen greenhouse shrubs, requiring much the same treatment as *Epacris*. Propagated by cuttings of the young shoots inserted in sand, under a bell-glass.

Principal Species :—

cordata (*see* *ovalifolia*).

divaricata, 6" to 12", My., wh.

ovalifolia, 6", My., wh.

ACTÆA.

Perennial herbaceous plants (*ord.* *Ranunculaceæ*) with racemes of white flowers and poisonous berries. Good plants for shady places. Propagated by division of the roots, and by seeds sown in spring.

Species :—

alba, 1' to 1½', berries wh.

spicata, 1', berries blk.

— *rubra*, 1', berries red.

ACTINELLA.

Hardy herbaceous plants (*ord.* *Compositæ*), of which the only one worth cultivating is *grandiflora*, 6", summer, yellow.

Acropera (*see* *Gongora*).

Acrophorus (*see* *Davallia*).

Acropteris (*see* *Asplenium*).

ACTINIDIA.

Hardy deciduous climbing shrubs (*ord.* Ternstroemiaceæ). They are suitable for trellises and walls, and like a light, rich soil. Propagation is by seeds, layers, and cuttings.

Principal Species :—

Kolomicta, sum., wh., polygama, sum., wh., rare, sweet, berries edible.
vulabilis, Je., wh.

ACTINOMERIS.

Herbaceous perennials, allied to Helianthus (*ord.* Compositæ). All the species mentioned below have yellow flowers. They are propagated by seeds and root division. Common soil.

Principal Species :—

alata, 3, Jy. (*see* Verbesina occidentalis). procera (*see* squarrosa).
squarrosa, 3, Jy., Aug.
helianthoides, 3, Jy. to Sep. (*syn.* Verbesina Coreopsis).

ACTINIOPTERIS.

A small genus of stove Ferns (*ord.* Filices), thriving in a compost largely made up of crocks and charcoal, with a little loam and peat. The temperature should not be allowed to fall below 60° in winter.

Principal Species :—

radiata. This pretty plant is like a miniature Fan Palm; australis is a robust variety of it.

ACTINOTUS.

Greenhouse herbaceous perennials (*ord.* Umbelliferae), propagated by seeds and root division. Helianthi is the only species of value, 2', June, white.

ADA.

A small genus of Orchids (*ord.* Orchidaceæ). Auranthiaca, the only species in general cultivation, is a valuable winter-flowering Orchid. For a few years after importation it does fairly well in a cool house, but greater success attends its cultivation in a warm greenhouse. Abundant drainage and a compost of peat and sphagnum will suffice.

Species (two only) :—

aurantiaca, 1', Jan., or. Lehmanni, 1', Jan., cin., red.

ADANSONIA.

Remarkable tropical trees (*ord.* Malvaceæ), with trunks from 30' in diameter. The African species, or Baobab, furnishes a useful fibre; the fruit is edible and of medicinal value, but the wood is very soft. The Australian species, or Cream-of-Tartar tree, has an acid fruit, from which inhabitants of tropical countries brew a refreshing drink. Stove plants; seldom cultivated under glass.

Species (two only) :—

digitata, 50', wh. Gregorii, 70', wh.

ADELIA.

Summer-flowering evergreen stove shrubs (*ord.* Euphorbiaceæ); propagated by cuttings in sandy loam; compost, loam and sand.

Principal Species :—

acidoton, 3, Je., grn., wh. Ricinella, 6, Jy., grn. wh. Bernardia, 6, Jy., grn.

Adelia acuminata of Michaux is quite a different subject, and is now referred to Forestiera acuminata in *ord.* Oleaceæ.

ADELOBOTRYS.

Rambling stove plants (*ord.* Melastomaceæ),

closely allied to Tibouchina (Lasiandra). Propagated by cuttings of half-ripe shoots, in summer, in heat. Soil, sandy loam and leaf mould.

Principal Species :—

Lindenii, 8', wh. to pur. scandens, wh.

ADENANDRA.

Summer-flowering evergreen shrubs (*ord.* Rutaceæ), requiring the temperature of a greenhouse. Propagated by cuttings of the young growths in very sandy soil; also by seeds when procurable. Soil, sound loam, with the addition of coarse sand if heavy, and one-third of decayed manure if poor.



Photo: D. S. Fish, Edinburgh.

ADENANDRA UMBELLATA.

Principal Species :—

amœna, 2', Je., red. umbellata, 2', Je., pk. (*see* figure).
fragrans, 2', Je., pk.

Other Species :—

coriacea, 1½', Je., pk. uniflora, 1½', Je., wh., pk.
marginata, 1½', Je., flesh.

ADENANTHERA.

East Indian trees and shrubs (*ord.* Leguminosæ). The bright scarlet seeds of pavonina are used as ornaments in the East, under the name of "Barricari seeds." Stove plants, needing a substantial compost. Propagation by seeds or cuttings.

Principal Species :—

bicolor, Jy., yel. falcata, 16', Je., yel.
chrysostachys, 15', yel. pavonina, 5', Jy., yel., wh.
(*syn.* Piptadenia chrysostachys).

ADENANTHOS.

Summer-flowering evergreen shrubs (*ord.* Proteaceæ); principally red flowered, and requiring the temperature of a greenhouse. Propagated by cuttings in sandy soil in spring. Soil, loam with some peat and coarse sand.

Actinocarpus (*see* Damasonium).

Aculeate

Acuminate } (*see* "Leaves" in Glossary).

Acute

Acynos (*see* Calamintha).

Adamia (*see* Dichroa).

Adamsia (*see* Puschkinia, Geum, and Sieversia).

Adam's Needle (*see* Yucca).

Adder's Tongue Fern (*see* Ophioglossum).

Principal Species :—

barbigera, 7', Je., red.
cuneata, 5', Jy., red.

obovata, 5', Jy., red.
sericea, 5', Jy., red.

ADENIUM.

Summer-flowering evergreen shrubs (*ord.* Apocynaceæ), requiring the temperature of a greenhouse. Propagated by cuttings in sand in spring. Soil, equal parts of sandy loam and peat or leaf mould.

Principal Species :—

Honghel, 3', Je., pale crim.
namaquarium, 6', Jy., pur.
(*see* Pachypodium namaquarium).

obesum, 3' to 4', Jy., pur.
speciosum, 3', Jy., pur.

ADENOCALYMNA.

Autumn-flowering evergreen climbers (*ord.* Bignoniaceæ), principally yellow flowered, and requiring the temperature of a stove. Propagated by cuttings in sand, with bottom heat. Soil, loam, leaf mould, and sand.

Principal Species :—

comosum, 10', Sep., yel.
longeracemosum, Oct., yel.

nitidum, 12', Feb., yel.

ADENOCARPUS.

Yellow flowered, hardy, deciduous, and greenhouse plants (*ord.* Leguminosæ). Propagated by cuttings inserted during spring or summer; also by seeds sown early in spring. Soil, loam, with coarse sand if adhesive.

Principal Species :—

foliolosus, 6', My., yel.
hispanicus, 6', Je., yel.

intermedius, 4', Je., yel.

Other Species :—

decorticans, 6', Je., yel.
frankenioides, 2', Ap., yel.

parvifolius, 4', My., yel.
telonensis, 3', Je., yel.

ADENOPHORA.

Hardy herbaceous perennials (*ord.* Campanulaceæ). Propagated by seeds sown in frames in spring, and transplanted to flower in the following year. Any fertile garden soil will do.

Principal Species :—

latifolia, 4', Aug., bl.

Other Species :—

communis, 4', Jy., bl.
coronata, 3', My., bl.
coronopifolia, 1½', Jy., bl.
Gmelinii, 2', Aug., bl.
Lamarckii, 2', Je., bl.

periplocæfolia, 6'', Je., bl.
stylosa, 2', My., bl.
tricuspidata, 1½', Jy., bl.
verticillata, 2', Je., bl.

ADENOSTOMA.

Hardy evergreen shrubs (*ord.* Rosaceæ) with white flowers. Propagated by cuttings of the young growths. Soil, fertile loam with peat.

Principal Species :—

fasciculatum, 3', Je., wh.

ADESMIA.

Greenhouse and half-hardy plants (*ord.* Leguminosæ), annual or perennial; trailing habit; yellow flowers in terminal racemes. Sow seed of annuals in warmth in spring; insert cuttings of shrubs in summer, under bell-glass. Soil, sandy loam. Seldom grown, though there are 168 species.

Principal Species :—**Annual—**

muricata, 1', Je.

pendula, 1', Je.

Perennial—

boronioides, 1½', My., Je.,
or, yel., shr.
glutinosa, 1½', My.
Loudonii, 2', My.

microphylla, 1', Jy.
uspallatensis, 1', Jy.
viscosa, 12', Aug.

ADHATODA.

A genus of herbs and shrubs (*ord.* Acanthaceæ) closely allied to Justicia. Nearly ninety species, few of which are cultivated. Propagated by cuttings, in sandy soil, in heat; stove plants needing a compost of loam, leaf soil or peat, and sand.

Principal Species :—

cydoniæfolia, 5', Aug., pur., wh.
vasica, 10', Aug., pur.

ADIANTUM. (MAIDENHAIR.)

Description.—Stove, greenhouse, and half-hardy Ferns (*ord.* Filices) of considerable beauty and value. Only one, pedatum, a native of North America, is really hardy. Upwards of a hundred species and varieties have been certificated by the Royal Horticultural Society since 1859.

Propagation.—By spores, sown in heat and kept close until germination has taken place; and by division of the old plants.

Soil.—Two parts of loam, one part of good leaf soil, and sand, for the older plants; equal parts of loam and leaf soil, with rather more sand, for the sporelings.

Other Cultural Points.—Although Adiantums are really evergreen Ferns, and therefore must not be allowed to get very dry, they all rest to some extent during the winter, and thus need considerably



ADIANTUM RHODOPHYLLUM (*see* p. 18).

less water than they do during the growing period. The popular cuneatum and its varieties are commonly treated as deciduous Ferns, all the fronds being cut down in the autumn, and they answer very well to the treatment.

The Beautiful farleyense.—This rarely, if ever, produces spores, and is propagated solely by division. It delights in a strong heat, with plenty

Adenotrichia (*see* Senecio).

Adiantopsis (*see* Cheilanthes).

of diffused light, but it must be kept out of the way of draughts. It likes to be kept in rather small pots, and under such conditions develops that delicate tinting which is its chief charm. Like all the Adiantums, it delights in occasional doses of liquid cow manure and soot during the growing period.

Tinted Maidenhairs.—Several species and varieties, such as *macrophyllum*, *colpodes roseum*, and *rubellum*, have pretty rose tinted fronds if judiciously exposed to the light.

Maidenhairs for Baskets.—*Lunulatum dolabriforme*, *cuneatum grandiceps*, *caudatum*, and *caudatum ciliatum* make excellent basket plants, but being strong growers they must be closely watched with regard to the water supply.



ADIANTUM CUNEATUM WEIGANDII (see next column).

Maidenhairs for Cutting.—To supply fronds for cutting, the most useful species and varieties are *cuneatum*, *cuneatum gracillimum*, *Pacotti*, and *Capillus-Veneris* (the British Maidenhair). If cut some hours before they are wanted for use, and thrown into a tub of water, the fronds last much longer than they do if taken straight from the plants.

For Egyptian Jars.—*Capillus-Veneris* takes kindly to the system of growing it upon the soft earthenware Egyptian jars. The slender rhizomes are bound firmly to the sides of the pot, and the latter is kept filled with water. Elegant hanging balls of greenery are the result.

Temperatures for Maidenhairs.—For the stove forms, 60° to 75°; for the greenhouse species and varieties, including the numerous varieties of the sub-hardy *Capillus-Veneris*, 45° to 55°.

Insect Enemies.—The most troublesome insect pests are brown scale and snowy fly. Sponging the affected stems and fronds with soapy water is the best remedy.

Principal Species :—

- æthiopicum*, 1' to 1½', st. (*syn. emarginatum*).
- *assimile*.
- affine*, 10" to 18", grh. (*syn. Cunninghamii*).
- aneitense*, 1½' to 2', st.
- Capillus-Veneris*, Venus's Hair, and Common Maidenhair, 6" to 10", hdy. in Cornwall. There are many varieties, of which the following five are the best :—
- *daphnites*, 9" to 12", warm grh.
- *imbricatum*, 4" to 8", st.
- *ludemannianum*, 4" to 6", grh.
- *magnificum*, 9" to 15", grh.
- *Mariesii*, 10' to 16", grh.
- caudatum*, 6" to 15", st.
- *ciliatum*, 6" to 15", st.
- colpodes*, 9" to 18", grh.
- *roseum*, 6" to 10", st., prettily tinted.
- concinnum*, 1' to 1½', st.
- *latum*, 1' to 1½', st.
- *Flemingii*, 1' to 1½', st.
- cuneatum*, 9" to 18", st. or grh.
- *dissectum*, 9" to 12", st.
- *gracillimum*, 9" to 15", st.
- *grandiceps*, 9" to 18", st.
- *mundulum*, 6" to 10", st.
- *Pacotti*, 4" to 9", st.
- *Weigandii*, st.
- diaphanum*, 6" to 8", grh. (*syn. setulosum*).
- excisum*, 6" to 15", st.
- excisum Leyi*, 3" to 6", warm grh.
- *multifidum*, 6" to 12", st.
- formosum*, 9" to 18", st.
- henslovianum*, 1' to 1½', st. (*syns. latum*, *Reichenbachii*, and *sessilifolium*).
- hispidulum*, 6" to 12", grh. (*syn. pubescens*).
- macrophyllum*, 9" to 16", st.
- palmatum*, 6" to 12", st.
- pedatum*, 1' to 3', hdy.
- polyphyllum*, 2' to 3', st. (*syns. cardioclæna* and *macrocladum*).
- pulverulentum*, 9" to 18", st.
- reniforme*, 5" to 8", st.
- *asarifolium*, 6" to 9", st.
- rubellum*, 4" to 6", warm grh. or st.
- tenerum*, 1' to 3', st.
- *farleyense*, 1' to 1½', st.
- *Lathomii*, 1½' to 2', st.
- tetraphyllum*, 1' to 1½', st. (*syns. fovearum* and *prionophyllum*).
- *gracile*, 1' to 1½', st.
- *Hendersonii*, 9" to 15", st.
- tinctum*, 6" to 12", st. or grh.
- trapeziforme*, 1' to 2', st.
- *cultratum*, 9" to 18", st.
- *Sanctæ-Catherinæ* (of gardens), 9" to 18", st.
- veitchianum*, 9" to 18", st.
- Williamsii*, 9" to 18", st.

Other Species :—

- æmulum*, 8" to 12", st.
- amabile* (*see Moorei*).
- *plumosum*, st.
- amenum* (*see flabellulatum*).
- andicolum* (*see glaucophyllum*).
- assimile*, a variety of *æthiopicum*.
- Bausei*, 1½' to 2', st. (*syn. trapeziforme decorum*).
- bellum*, 3" to 6", warm grh.
- bessonianum*, st.
- Burnii*.
- cardioclæna* (*see polyphyllum*).
- crenatum*, 1' to 1½', st. (*syn. wilesianum*).
- cristatum*, 1½' to 3', st. (*syn. kunzeanum*).
- cubense*, 6" to 12", st.
- cuneatum Lawsoni*, 6" to 15", grh.
- *Legrandii*, 4" to 9", st. or grh.
- *strictum*, st.
- Cunninghamii* (*see affine*).
- curvatum*, 1' to 1½', st.
- cyclosorum*, st.
- decorum* (*see Wagneri*).
- deltoideum*, 4' to 6", st.
- digitatum*, 1' to 3', st. or grh. (*syn. speciosum*).
- dolabriforme*, a variety of *lunulatum*.
- dolosum* (*syn. Wilsonii*).
- elegantissimum*, st.
- emarginatum* (*see æthiopicum*).
- farleyense* (*see tenerum farleyense*).
- Feei*, 1' to 2', st. (*syn. flexuosum*).
- flabellulatum*, 9" to 15", st. (*syn. amenum*).
- flexuosum*.
- fovearum* (*see tetraphyllum*).
- fulvum*, 9" to 12", grh.
- glaucophyllum*, 1' to 2', warm grh. (*syns. andicolum* and *mexicanum*).
- gracillimum* (*see cuneatum gracillimum*).
- Hewardia*, 9" to 18", st. (*syn. Hewardia adiantoides*).
- intermedium*, 9" to 18", st. (*syn. triangulatum*).
- kunzeanum* (*see cristatum*).
- latum* (*see henslovianum*).
- Lathomii* (*see tenerum Lathomii*).
- Lindenii*, 9" to 18", st.



ADIANTUM EXCISUM MULTIFIDUM (see p. 16).



ADIANTUM TRAPEZIFORME (see p. 16).

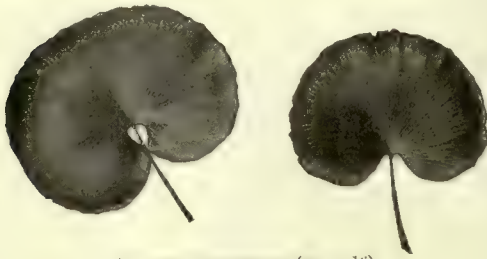


ADIANTUM MACROPHYLLUM (see p. 16).



ADIANTUM CONCINNUM (see p. 16).

SOME BEAUTIFUL MAIDENHAIRS.



ADIANTUM RENIFORME (see p. 16).

lineatum, st.
lucidum, 9" to 16", st.
luddemannianum (see C-V.
luddemannianum).
lunulatum, 6" to 12", st.
— dolabriforme, 6" to 14", st.
macrocladum (see polyphyllum).
macropterum (see Wilsonii).
mexicanum (see glaucophyllum).
microphyllum (see venustum).
monochlamys, 6" to 12", grh.
monosorum, st.
Moorei, 6" to 14", st. or grh.
moritzianum, 1' to 1½, grh.
neoguineense, 9" to 16", st.
obliquum, 6" to 12", st.
Owenii, st.
patens, 6" to 14", st.
peruvianum, 1' to 2', st.
populifolium (see Seemannii).
princeps, st.
prionophyllum (see tetraphyllum).
pubescens (see hispidulum).
Reichenbachii (see hen-slovianum).

rhodophyllum, st.
rhomboideum, very close to villosum.
Schneideri, st.
scutum (see tenerum scutum).
Seemannii, 9" to 24", st. (syns. populifolium and Zahnii).
sessilifolium (see hen-slovianum).
setulosum (see diaphanum).
speciosum (see digitatum).
subvulubile, 2' to 4', st.
sulphureum, st.
tenellum, st.
tenerum scutum, st.
trapeziforme pentadactylon, 9" to 18", st.
— Sanctæ-Catharinæ, st.
— Funckii, 9" to 16", st.
triangulatum (see intermedium).
varium, very close to villosum.
velutinum, 1½ to 2', st.
venustum, st.
versailense, st.
villosum, 9" to 18", st.
Wagneri, warm grh.
Waltonii diffusum, st.
Wilsonii, 9" to 12", st. (syns. dolosum and macropterum).
Zahnii (see Seemannii).

ADINA.

A small genus of cool stove plants (ord. Rubiaceæ), needing rich, loamy soil, and propagation by cuttings.

Principal Species :—

globiflora, 3' to 4', Jy., cream (syn. Nauclea).

ADINANDRA.

Evergreen stove trees or shrubs (ord. Ternstroemiaceæ), of very little horticultural value. The principal species is dumosa, 10', June, silky.

ADLUMIA.

Hardy herbaceous climber (ord. Fumariaceæ), succeeding in any good garden soil, propagated by seeds sown in a shady situation, where there is ample moisture.

Only Species :—

cirrhusa, 15', Aug., wh.

ADONIS.

Showy hardy perennials or annuals (ord. Ranunculaceæ), the former being particularly fine. The flowers are effective, and, combined with their

neat leaves, make them attractive in borders, shrubberies, or rock gardens. The perennials are propagated by division after flowering, or by seeds; the annuals by seeds. All will do well in ordinary garden soil, but the early perennial species like a peaty one. A sunny position should be chosen. Seeds of the perennials often germinate very slowly, and should not be despaired of for a year or more after sowing.

Principal Species :—

æstivalis, 1', Je., ann., crim.

amurensis, 1', yel. or wh. One of the earliest of our hdy. flowers; useful also for a cold house.

pyrenaica, 1½, Je., Jy., yel. A very beautiful plant, unique at its season. Flowers not so fine as those of vernalis.

vernalis, 1' or less, Mch., yel. One of our most beautiful spring flowers. It should never suffer from drought, although it ought to have sun at its flowering time. A large-flowered variety sometimes known as sibirica is even better.

Other Species :—

autumnalis, 1', My., ann., red.
wolgensis, 1', My., yel.
— sibirica, larger.
walziana, 1', My., per., yel.

ADOXA.

Hardy herbaceous and tuberous-rooted plant (ord. Caprifoliaceæ), will grow under the shade of trees. Increased by division. Flowers and leaves are too alike in colour for the former to be conspicuous.

Principal Species :—

Moschatellina, 1', Ap., grn. yel.



Photo: D. S. Fish, Edinburgh.

ADONIS VERNALIS.

ÆCHMEA.

Handsome herbaceous perennials (ord. Bromeliaceæ), requiring the temperature of a stove.

Several of the species are regarded as synonymous with various Billbergias, Bromelias, and Hohenbergias. Fulgens, its variety discolor, and Mariæ-Reginæ are the best horticulturally. As is the case with the majority of the members of the same order, propagation is effected by suckers; a suitable compost is formed of light loam and leaf mould in equal proportions, with coarse sand.

Principal Species:—

Barleei, 3', Aug., pur.	fulgens discolor, 2', Je.
bracteata, 2', Jy., yel.	sc., pur.
coelestis, 1½', Jy., bl. (syns.	Lindenii, 2', Aug., sc.,
Hoplophytum coeleste	pur.
and Hohenbergia	Mariæ-Reginæ, 2', Aug.
coelestis).	to Nov., vic., crim.
fasciata, 1½', Aug., pk., bl.	rosea, 1½', Jy. to Sep.,
(syns. Billbergia fasci-	ro.
ata, B. rhodocyanæa,	Veitchii, 1½', Jy. to Sep.,
and Æ. Leopoldii).	red.
fulgens, 1½', Jy. to Sep., sc.	

ÆCIDIDIUM.

A genus of fungi. As occasion requires, the species will be referred to under the particular plants they attack.

ÆGICERAS.

An unimportant genus (*ord.* Myrsinacæ). *Ma-jus* (*syn.* *fragens*) is the only species; it is an evergreen tree, requiring the protection of a greenhouse. Propagation by summer growths in sand; soil, loam and peat with sand. This species, which grows 10' high, has white flowers.

ÆGIPHILA.

Evergreen shrubs (*ord.* Verbenacæ), requiring the temperature of a stove. Propagation is by cuttings in sand with gentle bottom heat; soil, sound loam.

Principal Species:—

arborescens, 10', Nov.,	foetida, 2', Jy., lil.
cream.	grandiflora (see Clero-
diffusa, 2', Jy., yel.	dendron).

ÆGLE.

An Indian fruit (*ord.* Rutacæ), known as Bengal Quince, Marmelos, or Ball Fruit, which is credited with medicinal properties. Requires the temperature of a stove. Propagation by cuttings of ripe wood in sand, bottom heat; soil, best loam. The flowers are fragrant.

Principal Species:—

Marmelos, 6', Ap., wh.

ÆGOPODIUM.

The Goat Weeds (*ord.* Umbelliferæ) are generally regarded as troublesome weeds, though in some countries the leaves, having the odour of Angelica, are used in salads. The best known species, *Podagraria*, is widely distributed throughout Europe; its white flowers appear in June.

ÆOLANTHUS.

Annuals (*ord.* Labiatæ) requiring the temperature of a stove. Propagation by seeds. Soil, any good sandy compost.

Species (two only):—

Livingstonii, 1', Jy. to	suaveolens, 1', Jy., lil.
Oct., br.	

AERANTHES.

Air flowers (*ord.* Orchidacæ). A small genus closely allied to, and needing the same cultural

conditions as, *Angræcums*. The principal species is *grandiflorus*, 1', June, white and yellow.

AERATION.

The exposure of soil to the air. One of the chief objects of good cultivation is aëration of the soil; and draining, trenching, digging, and hoeing are all means to that end. If land is to be fertile air must be admitted freely, as it is of great importance to the well-being of roots. Soil that is heavily charged with water is practically sealed against air, and therefore drainage is necessary as a means of aëration. Stiff, clayey soils of a retentive character do not admit air freely, and are much improved by being ridged up roughly in the autumn, exposing the lumps to the action of the atmosphere. The result of this treatment is seen in the spring, when the soil is readily broken into small particles, and a good tilth is obtained. The want of aëration may be observed in land that has been neglected in matters of cultivation, as the soil becomes hard and close, and crops fail to flourish in it until brought back into a state of fertility. Frequently ground is condemned as poor, when all that is required is aëration by a thorough system of cultivation.

AERIAL ROOTS.

Air roots form upon the stem of the Vine, and to a less degree on that of the Tomato and Cucumber. They are of the nature of true roots, and readily work into soil or wet moss when brought into contact with it. Their presence generally indicates a sour, wet condition of the border, though they are also formed through the atmosphere of a house being kept too moist and close. As they are in no manner injurious in themselves, but rather beneficial in that their function is clearly to assist the roots proper, they should not be removed, but allowed to remain until the end of the season, when they will wither away naturally. After the fruit is gathered the border should receive a thorough overhauling, the roots be brought to the surface, pruned where necessary, and re-laid in fresh, sweet soil. The following season afford more ventilation during the early stages of growth.

AERIDES.

Description.—A large genus of Orchids (*ord.* Orchidacæ) consisting chiefly of species needing the temperature of a stove and moist atmospheric conditions. The leaves are evergreen. The flowers, often fragrant, are produced in graceful racemes that are sometimes branched.

Cultural Points.—Like most other epiphytic and moisture-loving Orchids, the *Aërides* succeed if planted in pots, pans, or teak baskets, among crocks, and then surfaced with a good layer of living sphagnum. Broadly speaking, the growing season is from March to October, and then the night temperature should be from 65° to 75°, while during the day it may rise to 85°, provided shade is afforded and the house ventilated. During autumn and winter the temperature should be 60° to 65° by night, with a rise of 5° to 10° by day during bright weather. Water freely during the growing season, but moderately during winter. At all seasons of the year frequently damp down all wall and stage surfaces, but do not throw water on the heated hot-

Egochloa (see *Gilia*).

Æonium (see *Sempervivum*).

Æranthus (see *Angræcum*).

water pipes. Sponge the leaves frequently to remove dirt and insects. If plants become leggy they may have the lower portion cut away, provided there are sufficient roots left to anchor the plant in the crocks and sphagnum. Repotting and the reduction of the stem should only take place when growth is commencing. Be always careful not to break off the points of the roots.

Vandarum, found at a considerable elevation in North India, grows best if wired to a block of Birchwood, with a little sphagnum about its roots, and suspended at the warmer end of the cool Orchid house. It has slender growths and small foliage.

Principal Species and Varieties :—

crassifolium, 2', My., Je., amethyst pur.	Lawrenceæ sanderianum, 3', yel., pur.
crispum, 4', Je., Jy., wh., ro. There are two pretty vars. of this species — i.e. lindleyanum and Warneri.	multiflorum Lobbii, 1½', Jy., wh., rich pur.
Fieldingii, 3', My. to Jy., wh., br., ro. (see fig.).	odoratum, 2', Jy., wh., lil.
Lawrenceæ, 3', Sep., grn. to yel., pur.	quinquevulnerum, 3', Jy., pk.
	suaissimum, 2', Jy. to Sep., wh., lil.



AERIDES FIELDINGII.

Other Species and Varieties :—

expansum Leonæ, 2', Je., Jy., wh., pur.	mitratum, 1½', Jy., wh., pur.
falcatum, 3', Je., wh., ro.	multiflorum, 1½', Jy., wh., pur.
houlettianum, 2', My., Je., buff, magenta.	ortgiesianum, 3', Jy., red, wh., grn.
illustre, 2', Je., wh., lil., pur.	Reichenbachii, 3', Je., wh., pur. spotted.
japonicum, 6', Je., Jy., grn., wh., pur.	Roebelenii, 2½', Jy., wh., grn., yel.
lepidum, 2', Jy., wh., pur.	Vandarum, 1', Sep., wh.
maculosum, 2', Je., pur. spotted.	virens, 2', Aug., wh., pur.

ÆRUEA.

This genus (*ord.* Amarantaceæ) comprises many species, two of which are herbaceous perennials re-

quiring the temperature of a stove. Propagation by division. Soil, any fertile compost.

Principal Species :—

javanica, 2', Je., wh.
lanata, 1', Je., wh. (<i>syn.</i> Celosia lanata).

ÆSCHYNANTHUS.

Description.—Brilliantly beautiful plants (*ord.* Gesneraceæ) that should have a place in every stove. Plants may be successfully grown upon old tree stumps with moss, or in teak wood baskets after the style of those employed for Orchids.

Propagation is carried out by means of half-ripened growths inserted in sandy soil beneath a bell-glass; a little bottom heat is advantageous.

Soil.—A suitable compost consists of fibrous loam, coarse sand, and a small quantity of leaf mould or flaky manure. Being epiphytic, perfect drainage is an absolute essential. Chopped sphagnum is an excellent addition to the compost when the plants are grown in suspended baskets.

Principal Species :—

atrosanguinea, 1', Jy., dark red.	Paxtonii, 2', Ap., sc.
bracteata, 1½', Aug., sc., yel. (<i>syn.</i> Peclii).	purpurascens, 1', Meh., pur., yel.
fulgens, 1', Je., sc., yel.	splendida, 1', Jy., vio., sc., or.
grandiflora, 5', Aug., sc.	tricolor, 1', Jy., red, yel., blk.
Hildebrandii, 9', Jy., sc.	
lobbiana, 1', Je., sc.	

Other Species :—

candida, 1', Jy., wh., red.	miniata, 1½', Je., sc. (<i>syn.</i> Trichosporum radicans).
chinensis, 1', Jy., sc.	pulchella, 2', Jy., sc., yel.
discolor, 1', Jy., grn., sc.	pulchra, 1', Jy., sc. (<i>syn.</i> Trichosporum pulchrum).
Horsefieldii, 1½', Aug., sc.	radicans, 1½', Aug., red.
javanica, 1', Jy., sc., yel.	ramosissima, 3', Je., sc. (<i>syn.</i> parasitica).
Lamponga, 1', Jy., sc. (<i>syn.</i> Boschianus).	repens, 9', Je., sc.
Lindenii, 1', Jy., red.	Roxburghii, 2', Jy., sc.
longiflora, 2', Je., sc. (<i>syn.</i> Lysionotus longiflora).	speciosa, 2', Je., or. red. (<i>syn.</i> Aucklandii).
maculata, 3', Aug., sc.	zebrina (see marmorata).
marmorata, 1', Jy., grn., br., red.	

ÆSCHYNOMENE.

This genus (*ord.* Leguminosæ) comprises annuals and shrubby perennials, almost all of which require stove culture. Propagation of annuals by seeds, and perennials by cuttings under a bell-glass, in sandy soil, in a high temperature; soil, sound loam.

Principal Species :—

americana, 2', Jy., ann., yel.	aspera, 6', Je., per., yel.
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Other Species :—

crepitans, 3', Jy., shr., yel.	pumila, 2½', Jy., yel.
hispidula, 2', Aug., hdy., yel.	subviscosa, 1½', Jy., yel.
indica, 2', Je., yel.	sensitiva, 3', Jy., shr., wh.
pendula, 2½', Jy., shr., yel.	viscidula, 2', Jy., grh., yel. (<i>syn.</i> prostrata).

ÆSCULUS.

Well known large and handsome deciduous trees (*ord.* Sapindaceæ), that are valuable as single specimens, and for the formation of clumps and

Ærobin (see *Angræcum*).

avenues. Propagation by seeds, layers, buds, and grafts; soil, deep loam. The Horse Chestnut in its several varieties is the best known member of this genus.

Principal Species :—

californica, 20', Jy., wh. (*see* *Pavia californica*).
carnea, 20', Je., pk. (*syns.* *floribunda*, *rubicunda*, *Pavia watsoniana*).
chinensis, 15', Je., wh. (*syn.* *sinensis*).
flava, 20', My., yel. (*syns.* *lutea*, *octandra*, *Pavia bicolor*, *P. flava*, *P. lutea*).

Hippocastanum, 40', My. and Je., wh.; flore pleno is a double form of this species, with handsome wh. and pk. flowers; foliis aureis variegatis has golden variegated leaves, and is dwarfer than the type.

parviflora, 8', My., Je., wh. (*see* *Pavia alba*).

Other Species :—

glabra, 12', My., grn., yel. (*syns.* *ohioensis* and *Pavia ohioensis*).

indica, 40', Jy., wh.

Pavia, 8' to 20', Je., red (*see* *Pavia rubra*).

ÆTHERIA.

A very small genus of terrestrial Orchids (*ord.* *Orchidaceæ*), closely allied to *Goodyera*. For compost use peat or leaf soil, sphagnum and sand, and afford warm, moist conditions:

Principal Species :—

occulta, 6'', My. to Je., wh. grn. (*syn.* *Goodyera occulta*).

ÆTHIONEMA.

A genus of dwarf growing annuals, biennials, and perennials (*ord.* *Cruciferae*), that may be accommodated on the rockery. Propagation by seeds and cuttings; ordinary garden soil.

Principal Species :—

Buxbaumii, 6'', Je., ann.,	heterocarpum, 6'', Jy.,
pale red (<i>syn.</i> <i>Thlaspi arabicum</i>).	per., pur.
coridifolium, 3'', Je., per.,	membranaceum, 6'', Jy.,
ro.	lil.
gracile, 6'', Je., ann., pale	monospermum, 6'', Jy.,
red.	bien., pur.
grandiflorum, 1½', My.,	saxatile, 6'', Je., fl. ann.
per., ro.	(<i>syn.</i> <i>Thlaspi saxatile</i>).

ÆTHONIA.

Dwarf evergreen shrubs (*ord.* *Compositæ*), needing greenhouse protection. Propagated by cuttings; any good light soil. Generally included in *Tolpis*.

Principal Species :—

filiformis, 1½', Je., yel. fruticosa, 2', Je., yel.

ÆTHUSA.

An unimportant genus of hardy annuals and perennials (*ord.* *Umbelliferae*), of easy culture. Propagation by seeds and division.

Annual Species :—

cynapioides (*see* *Cynapium*). *Cynapium*, 2', Jy., wh. elata (*see* *Cynapium*).

Perennial Species :—

fatua, 2', Jy., wh. (*see* *Carum verticillatum*).

AFRICAN LILY (see AGAPANTHUS).

Æthcilema (*see* *Phaylopsis*).

Æthcorhiza (*see* *Crepis*).

African Almond (*see* *Brabejum*).

AFZELIA.

This genus comprises a few species of evergreen trees (*ord.* *Leguminosæ*), requiring stove treatment. Propagation by cuttings under a bell-glass in heat. Soil, peat and leaf mould.

Principal Species :—

africana, 30', Je., crim.

AGALMYLA.

Stove plants (*ord.* *Gesneraceæ*) that may be grown on blocks, in baskets, or in pots. Propagation by cuttings under a bell-glass. Compost, fibrous peat, moss, charcoal, and sand.

Species (two only) :—

longistyla, 1', Jy., crim.

staminea, 6'', Je., sc. (*syns.* *Justicia parasitica* and *Cyrtandra staminea*).

AGANISIA.

Very pretty and neat little epiphytic Orchids (*ord.* *Orchidaceæ*), with blue or bluish flowers. Grown on teak rafts, or in baskets, with peat and sphagnum; they succeed under warm *Dendrobium* treatment. Syringe freely daily during the growing season; water sparingly when at rest. Propagation by division of rhizomes.

Principal Species :—

cerulea (<i>see</i> <i>Acacallis</i>	ionoptera, 1', Jy., wh.,
cyanea).	pur.
cyanea (<i>see</i> <i>Acacallis</i>	pulchella, 9'', Je., wh.,
cyanea).	cream, yel.
graminea, 6'', Jan., yel., red.	tricolor, 1¼', My., bl., yel.

AGAPANTHUS. (AFRICAN LILY.)

Description.—A beautiful genus (*ord.* *Liliaceæ*) from the Cape of Good Hope, suitable for growing in pots for greenhouse or conservatory. They are hardy in some mild, sheltered districts.

Propagation.—From seeds occasionally, but chiefly by division of the roots in the spring. Wash the soil from the roots, divide the bulbs singly or in masses of several, giving pots to suit the size of divided pieces.

Soil.—Agapanthus being often grown in large pots or tubs, in which they are allowed to remain undisturbed for several years, it is worth while to prepare a good compost. Three parts of sound loam, with one part of decayed manure and a liberal sprinkling of sand, will suit.

Cultural Points.—No greenhouse plant is easier to manage. The roots will bear confining, and large specimens will go for several years without re-potting. A cool house from which frost is excluded is suitable for wintering the plants. Give little water during the resting period. Plant outdoors in sheltered situations in beds and borders, and on the banks of lakes. It is advisable to afford some protection to the roots in the winter.

Species (one only) and Varieties :—

- umbellatus (type), 3', Ap., bl.
- albidus, 2', Sep., wh.
- flore pleno, double.
- giganteus, 3', bl.
- Leichtlinii, 1', Je., bl.
- maximus, very large (also a wh. form).
- minor, small, bl.
- mooreanus, 1½', Sep., hdy., bl.
- variegatus, 2', Ap., bl.

African Marigold (*see* *Marigold*).

African Oak (*see* *Vitex*).

A Selection :—

- umbellatus. — maximus.
— albidus. — variegatus.

AGAPETES.

A small but beautiful genus of Indian shrubs (*ord.* Vacciniaceæ) requiring a warm intermediate house. Propagation by cuttings in very sandy soil, under a bell-glass, with bottom heat. Compost, fibrous peat, loam, and sand.



AGAPETES BUXIFOLIA.

Principal Species :—

- buxifolia, 5', Ap., My., ro.
macrantha, 3', red to yel. (*syn.* Thibaudia macrantha).
variegata, 3', Ap., My., sc. (*syns.* pulcherrima and Thibaudia pulcherrima).

Other Species :—

- setigera, 3', Ap., sc.

AGARICUS. (MUSHROOMS.)

A very large genus of fungi (*ord.* Fungi), and one that is as widely distributed as it is extensive. As a rule the various species delight in warm, damp situations where decaying animal or vegetable matter is found. Propagation is effected by means of spores that are microscopically small, and situated between the gills or laminae that are so well known as forming the under surface of the umbrella-shaped head of a Mushroom or Toadstool. Another method of propagation is by means of hyphae, the white underground portion of the plant known technically as spawn; when the conditions are not favourable for the production of "Mushrooms," *i.e.* the fruiting or spore-bearing portion,

Aganosma (see Ichmocarpus).

the spawn increases almost indefinitely, and this has been taken advantage of in the case of the cultivated Mushroom to manufacture the bricks of spawn sold by nurserymen.

For culture, *see* MUSHROOM.

The Principal Species are campestris and vaginatus, both edible. The large majority of the others are more or less poisonous.

AGARISTA.

Evergreen shrubs (*ord.* Ericaceæ) requiring a warm greenhouse. Equal parts of sandy peat and loam form a good compost. Cuttings of half-ripe growth should be inserted in very sandy peat under a bell-glass.

Principal Species :—

- neriifolia, 2', Je., crim.
pulchra, 2', My., grn. wh.

AGASTACHYS.

A handsome evergreen greenhouse shrub (*ord.* Proteaceæ) that thrives in a compost of peat, loam, and sand. Increased by cuttings of ripe wood placed in sand under a bell-glass.

Species :—

- odorata, 3', Je., pale yel.

AGATHÆA.

Greenhouse plants (*ord.* Compositæ) of dwarf habit and easy cultivation. Use a compost of loam, leaf soil, and sand, and do not overpot. Propagation is effected by cuttings in spring or autumn.

Principal Species :—

- coelestis, 1½', Je., bl.; popularly known as the "Blue Marguerite."
linifolia, 2', Je., bl.



AGATHÆA COELESTIS, THE "BLUE MARGUERITE."

AGATHELPIS.

Shrubby South African plants (*ord.* Selaginæ) of no horticultural value. Grow in greenhouse in sandy loam and peat.

Species :—

- angustifolia, 3', My., wh. parvifolia, 3', My., wh.

AGATHIS.

Lofty trees (*ord.* Coniferæ) chiefly Antipodean, though a few are found in the Malayan Peninsula.

The native name for trees and timber is Dammar. The Kauri Pine (*australis*) is perhaps the best known species. All can be grown in large conservatories in loam and peat.

Principal Species :—

australis, 49' to 230'. *Moorei*, 30'.

Other Species :—

loranthifolia, 50'. *obtusa*, 50'.
macrophylla, 40'. *robusta*, 100'.

AGATHOPHYLLUM.

The only species of note is an evergreen stove tree (*ord.* Laurinæ), remarkable for the Clove-like odour of its leaves, and the fragrance of its bark and dried fruits. Peat, or leaf soil, and loam form a suitable rooting medium. Cuttings are easily rooted in sandy soil, in heat.

Principal Species :—

aromaticum, 30', Jy., wh. (Correctly known as *Ravensara aromatica*.)

AGATHOSMA.

(*Ord.* Rutaceæ.) Evergreen greenhouse shrubs from South Africa. All have a powerful odour, but few are now cultivated. Firm potting in peat and sand is necessary; it is advisable to afford shade during summer. Cuttings are best struck in sand, under a bell-glass, in a cool frame.

Principal Species :—

hirta purpurea, 2', My., Je., pur.
imbricata, 3', My., Je., pinkish pur.
— *acuminata*, 5', My., Je., vio.
rugosa, 2', My., Je., wh.

Other Species :—

brevifolia, 2', My., Je., pur. *hirta*, 2', My., Je., wh.
cuspidata bruniades, 2', *hispida*, 1', My., Je., vio.
pur. *vestita*, 2', My., Je., lil.
ciliata, 2', My., Je., wh. *villosa*, 2', My., Je., vio.
erecta, 2', bl., wh.

AGAVE.

Description.—A genus of plants (*ord.* Amaryllidæ) not properly appreciated in gardens, where they produce a fine effect, either under glass or for sub-tropical gardening outdoors in summer. The best for the latter purpose is probably *americana*, though others might be largely used. Large specimens in tubs or vases may be employed to produce a massive effect on terraces or at the top of flights of steps in the garden. Under glass they are very striking, and it is unfortunate that good collections are so seldom met with in private gardens. Their fleshy leaves, often decorated with spines and prickles, are very handsome. They flower so seldom that the popular tradition is applied to them, as to the Aloe, that they only flower when 100 years old. This is a fallacy, as some bloom frequently even when young. Sartori may be cited as one of this free-flowering class. The flowers are funnel shaped, and are mostly greenish yellow. They often remain in a small state for many years, so that they are very suitable for amateurs.

Propagation.—By suckers, when obtainable, taken off and put into pots filled with loam, leaf mould, and sand, with a little peat; or by seeds sown in heat in spring.

Soil.—That given in the directions for propagating is suitable, with the addition of a little thoroughly decayed cow manure, previously heated so as to destroy any pests which may be in it.

Agathyrus (see *Lactuca*).

Agati (see *Sesbania*).

Some add a little brick rubbish to the compost. Ample drainage is necessary.

Other Cultural Points.—The greater number will thrive in a greenhouse temperature, only a few requiring more heat. The hardness of many has not yet been tested, so that a number might do with a lower temperature than is at present thought necessary. In summer they ought to have free supplies of water, but these should be gradually reduced on the approach of winter, when they need very little. Plants outdoors must be housed before frost.

Principal Species :—

[The nomenclature is that of Mr. J. G. Baker's "Handbook of the Amaryllidæ," to which work specialists might refer for full descriptions.]

americana, 20' to 30', leaves 2½' to 6' long, with sharp, dark br. point and prickles. The best varieties are *picta* (*syn.* *ornata*), which has golden yel. leaves, bordered with deep grn.; and *variegata*, with a grn. centre and a yel. border to the leaves. According to Mr. Baker, *americana* was introduced into Europe about the middle of the sixteenth century, and flowered at Hampton Court in 1714. One of the hardiest and most useful. *dasyliroides*, 10', yel., leaves 1½' to 3', glaucous. A desirable Agave.

filifera, 4', grn., leaves 9' long, with grey, wiry threads along the margin. The form called *filamentosa* is even preferable to this.

Kerchovei, a variable and widely grown plant, almost stemless, with leaves 1' long, dull grn. with grey margin. *Diplacantha* is one of the best forms (*syn.* *Beaucarnei*).



Photo: D. S. Fish, Edinburgh.

AGAVE ATTENUATA, SHOWING PORTION OF FLOWER SPIKE.

Sartori, 8', leaves 2', light grn., pale central band. A free-blooming, valuable plant (*syns.* *cæspitosa*, *pendula*, etc.).

utahensis, 5', leaves 3'. The hardiest of the genus yet discovered, and hdy. in mild districts in Great Britain.

vivipara, 20', leaves 3'. The flowers often produce bulbils, which become young plants (*syns.* *Cantula Rumphii*, and *Fourcroya Cantula*).

yuccæfolia, 20', leaves 2½'. A very fine Agave (*syn.* *cohniana*).

Other Species :—

albicans, 5', leaves 1½'.

atrovirens, 30', leaves 4'

(*syns.* *salmiana* and

tehuacanensis).

attenuata, 12', leaves 2½'

(*syns.* *glaucescens*, *spec-*

tabilis) (*see* p. 23).

Botteri, 7', leaves 2'.

celsiana, 5', leaves 2'.

densiflora, 7', leaves 2'.

ferox, leaves 2'.

heteracantha, 10', leaves 1'.

Hookeri, 30', leaves 4'.

horrida, 8', leaves 1' (vars.

Gilbeyi, *levior*, etc.).

lophantha, 15', leaves 3'.

lurida, 16', leaves 3'.

macracantha, 3', leaves 1'.

maximiliana, leaves 2'

(*syn.* *gustaviana*).

mexicana, 18', leaves 3'.

micracantha, 7', leaves 1½'.

miradorensis, 20', leaves 2'.

polyacantha, 12', leaves 2'.

pruinosa, leaves 2' (*syns.*

Ghiesbreghtii and *den-*

tata).

rigida, 15', leaves 2'.

schidigera, 8', leaves 9".

Scolymus, 14', leaves 1½'.

seemanniana, 6', leaves 9".

Shawii, 12', leaves 1'.

striata, 8', leaves 2½' (vars.

recurva, *stricta*, etc.).

univittata, 12', leaves 2½'.

variegata, 3', leaves 1½'.

Victoriæ Reginæ, 10',

leaves 6".

virginica, 4½', leaves 1'.

xylonacantha, 14', leaves

1'.

There are many others.

AGERATUM.

Description.—Hardy and half-hardy annuals (*ord.* *Compositæ*), but may be kept perennials by not allowing the plants to ripen seeds, and propagating by cuttings. Mexicanum and the numerous varieties obtained from it are very useful for bedding purposes.

Propagation.—From cuttings inserted over a slight hotbed in spring or autumn. Garden varieties are readily raised from seeds sown in heat in the spring. Plant out in May.

Soil and Culture.—Ageratums like a light, rich soil. Tall sorts are useful for back lines in long borders and for grouping, the dwarf varieties for edging and mixing with other bedding plants. They bloom freely from June till October.

To keep plants and freshly rooted cuttings through the winter, any light position will suit where the temperature does not fall below 40°.

Principal Species :—

mexicanum, 2', Je., half-hdy., bl.

Other Species :—

angustifolium, 1', Jy.,

grh., wh. Lasseauxii, 1½', sum., ro.

cæruleum, 1', Jy., grh., wh. latifolium, 2', Jy., hdy.,

bl. Wendlandii, 1', bl.

A Selection :—

There are several garden varieties of Ageratum, and those who want plants for the summer border may choose from :—

Blue Perfection. Swanley Blue.

Imperial Dwarf Blue. The Zoo.

AGLAIA.

Warm greenhouse shrubs (*ord.* *Meliacæ*), of no great horticultural value. A light, rich compost

Agénora (*see* *Hypochaeris*).

will suit them. Cuttings of half-ripe growth root freely in sandy soil.

Principal Species :—

odorata, 8', Feb., Mch., yel., sweet, flowers used by Chinese to scent tea.

Other Species :—

acuminatissima. oxyapetala. rufa.

AGLAONEMA.

A large genus of dwarf, perennial stove plants (*ord.* *Aroideæ*), needing a compost of loam, peat, and sand, and a hot, moist atmosphere. Grown chiefly for the sake of their prettily variegated leafage. Propagation by seeds or division, in bottom heat.

Principal Species :—

angustifolium, 1½', Jy., oblongifolium Curtisi, 1',

greenish wh. Jy., grn., wh.

costatum, 6", Jy., wh. pictum, 1½', Aug., wh.

Other Species :—

commutatum, 1', Jy., wh. pumilum, 6", Aug., grn.,

Mannii, 1½', Jy., grn. wh. wh. (*syn.* *rotundum*).

oblongifolium, 4', Jy., simplex, 1½', Jy., wh.

crim. (*syn.* *nitidum*).

AGONIS.

A small group of Australian plants (*ord.* *Myrtaceæ*), that are best accommodated in a warm greenhouse, and grown in any good, light compost. Propagation by seeds or cuttings.

Principal Species :—

flexuosa, 15', sum., wh. marginata, sum., wh.

AGRIMONIA.

Hardy herbaceous perennials (*ord.* *Rosacæ*), allied to *Potentillas*. Increased by division, and thriving in good garden soil.

Principal Species :—

Eupatoria, 4', Je., yel. odorata, 4', Jy., yel.

leucantha, 3', Jy., yel. suaveolens, 3', Jy., yel.

AGROSTEMMA.

These plants (*ord.* *Caryophyllacæ*) are known as the Rose Campions. They bear abundance of bright blossoms, and are readily grown in any good garden soil. Propagated either by division or from seed. The various species are now referred to *Lychnis*, which see. Reference may, however, be made to what is known in gardens as *coronaria*, a plant easily raised from seed, and represented now by fine silvery leaved strains bearing either crimson or white flowers.

AGROSTIS.

Particularly elegant Grasses (*ord.* *Graminæ*). The flower spikes, either fresh or dried, are charming for association with cut flowers. Though all are hardy, it is best to treat them as half-hardy annuals. Good garden soil.

Principal Species :—

alba, 2', Jy. pulchella, 1½', Jy.

nebulosa (Cloud Grass),

1½', Je. to Aug.

Aglaomorpha (*see* *Polypodium*).

Agnostus (*see* *Stenocarpus*).

Agonopteris (*see* *Acrostichum*).

Agriotes (*see* *Wireworm*).

Agrotis (*see* *Turnip Moth*).

Other Species :—

Less elegant than the former are *canina*, *nigra*, *rubra* and *vulgaris*.

AILANTUS.

(*Ord.* Simarubææ.) A splendid hardy deciduous tree, but one that needs some shelter from cold winds if its beauty is to be preserved. Its popular name is Tree of Heaven. If young plants are annually cut back close to the ground, and in the following spring have the growths reduced to one only, magnificent leaves are produced, which have quite a tropical effect. Rich soil is necessary under the latter conditions.

Principal Species :—

glandulosa, 25', Sep.

AINSLIÆA.

The only species in cultivation is a small-growing, rather woody plant (*ord.* Compositæ), bearing its flower heads in racemes. Cool greenhouse treatment, and a compost of loam, leaf mould, and sand, will meet its requirements. After several trials the plant cannot be recommended horticulturally.

Species :—

Walkera, 2', Jan., bluish wh.

AIR.

Our atmosphere is composed, broadly speaking, of about four parts of nitrogen to one of oxygen; this also holds moisture in suspension, and it is estimated that water is never represented by less than one part in every hundred parts of air. In addition to these, air contains about a tenth part of 1 per cent. of carbonic acid. Considering how largely all these elements enter into the composition of plants, and to what extent they are absorbed through either leaf, stem, or root, it becomes evident that plants cultivated under glass must have regular supplies of fresh air. "Giving air" and "airing" are technical terms generally understood by horticulturists, but too often are only considered as means of reducing the temperature. With modern methods of building and heating it should be easy enough nowadays to so ventilate houses that while the occupants receive all the advantages of fresh air, they are not subjected to cold draughts and resulting attacks of mildew.

Air in the form of gentle, flowing "showers"—not strong, keen, concentrated "draughts"—is a sovereign panacea for many ills to which plants are heir. The amateur who sees his seedling Stocks collapse is often awed when he learns that there is a fungus with a formidable name at work, but the trouble is just the familiar "damping-off," which fresh air and judicious watering will prevent.

The Grape grower who sees patches on his berries, and knows that the dreaded "scald" has come, may be inclined to bemoan the perversities of nature, yet if he had got up early and given air before the rapidly rising temperature had dried up the moisture condensed on the surface of the berries, no scalding would have appeared.

At the time that this dictionary passes into the press, horticulturists have before them the startling pronouncement of Sir William Crookes relative to the discovery of a means by which nitrogen can be extracted from the atmosphere and applied to the nourishment of crops. The Editor trusts to be able to record successful experiments and the establishment of the process on a sound commercial basis in his Second Edition.

AIRA.

Graceful Grasses (*ord.* Gramineæ) easily grown in fairly moist garden soil.

Principal Species :—

caryophyllea, Jy., silvery.
flexuosa, 1½'.

præcox, 2' to 3', My., grn.
(*see also* Deschampsia).
pulchella, 6' to 8'.

AITONIA.

There is only one species of this genus (*ord.* Sapindaceæ), a shrubby evergreen requiring the temperature of an ordinary greenhouse. Propagation



STRIKING CUTTINGS UNDER A BELL-GLASS.

is by cuttings of the young growths in very sandy soil, under a bell-glass. Compost, peat and loam in equal parts, with coarse sand.

Species :—

capensis, 2', Jy., pk.

AIZOON.

South African succulent plants (*ord.* Ficoideæ) of no horticultural value. They require the temperature of a greenhouse, with full sun and very sandy soil. Propagation by cuttings and seeds.

Principal Species :—

sarmentosum, 9", Jy., greenish wh.

Other Species :—

canariense (*see* *Sesuvium lanceolatum*, 1', Jy., red.
Portulacastrum). *perfoliatum* (*see* *Tetraglinoides*, 1', Jy., yel.
hispanicum, 9", Jy., wh. *gonia Zeyheri*).

AJUGA.

A genus of about thirty perennials and annuals (*ord.* Labiatae). Propagated by division in spring or autumn, or by seeds sown in the open in spring. Common garden soil. The cultivated species are hardy, and need no special attention, except to prevent them from overrunning other plants. Several of the species send out runners.

Principal Species :—

genevensis, 1', My., etc., type bl., but varying to pk. and wh. A pretty rock garden or border plant. The best form is *Brockbankii* (*syns.* *alpina* and *rugosa*).

reptans, 6", My., etc., bl. A useful carpeting plant, thriving well in shade. The pur. leaved and variegated forms are the best for the garden. *Grandiflora* is good.

Air pipes (*see* *Heating*).

Air Plant (*see* *Aërides*).

Principal Species :—

urea, 9", Jy., yel. farinosa, 9", Je., wh.
capensis (see Veltheimia nepalensis.
viridifolia).

ALEURITES.

These are handsome trees (*ord.* Euphorbiaceæ) with inconspicuous flowers, requiring the temperature of a stove and sound loam as a rooting medium. Propagation by cuttings of the ripened growths in sand under a bell-glass, with bottom heat. Triloba is the celebrated Candleberry Tree of the Tropics.

Principal Species :—

cordata, 10', Ap., wh. triloba, 10', sum., wh.
moluccana (see triloba).

ALEXANDER.

This is a popular name under which *Smyrnum Olusatrum* is frequently known; another popular title is Alisander. Sown out of doors in May, it is subsequently treated like Celery. The plant was formerly much cultivated, the blanched stems being regarded as of medicinal value. Celery has now completely ousted Alexander or Alisander from the kitchen garden.

ALHAGI.

The Egyptian *A. Maurorum* (*ord.* Leguminosæ) exudes a gum which is supposed by some persons to be the manna of the Scriptures. The species must be grown in the greenhouse, and may be propagated from cuttings in sand under a bell-glass, or raised from seeds when procurable. Soil, loam and peat.

Species :—

Camelorum, 2', Jy., red. Maurorum, 2', Jy., red.

ALIBERTIA.

This evergreen tree (*ord.* Rubiaceæ) requires the temperature of a stove for successful culture, and a well-drained fertile mixture of loam and peat for the roots; it is propagated by cuttings in heat.

Only Species :—

edulis, 12', Je., cream.

ALISMA.

The Water Plantains (*ord.* Alismaceæ) are hardy aquatics, that thrive in baskets of loam sunk into water; propagation is by division and seeds. Plantago was in earlier times recommended by some authorities in cases of hydrophobia.

Principal Species :—

Plantago, 2', Jy., wh. — lanceolata, 2', Jy., wh.

Other Species :—

natans (or Elisma natans), 1', Jy., wh.
ranunculoides, 1', Aug., wh.

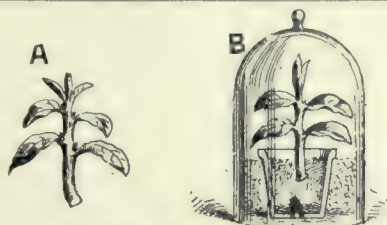
ALLAMANDA.

Description.—A genus of free-flowering stove plants (*ord.* Apocynaceæ). Their large, trumpet-shaped flowers are produced in great profusion through the summer. When grown as specimens in pots Allamandas are very effective, and they are also useful as stove climbers.

Propagation.—From cuttings of young, half-ripened shoots, inserted in sand in a brisk heat in a propagating frame or under a bell-glass. March is the best month for propagation.

Soil.—Fibrous loam, with sufficient sand to keep it open and about one-fifth of well-decayed manure for established specimens. Use leaf mould instead for small plants.

Other Cultural Points.—Place rooted cuttings in 6" pots, and grow in a temperature ranging from 65° to 75°. Pinch out the points of the leading shoots to induce the lower buds to break, and expose fully to sunshine. Shift the plants into larger pots as they require it, using rather rougher compost than before, and train the shoots to stakes or a stout wire trellis. The increased night and day temperature through the summer will benefit the plants, and in the autumn, when the leaves commence to turn yellow, withhold water gradually. Winter the plants in a temperature from 55° to 65°. In February remove the green shoots, cut back into the ripened wood, shake out the plants, and repot. Thoroughly moisten the old ball before potting,

**PROPAGATING ALLAMANDAS.**

A A cutting formed of a half-ripened shoot.
B A single cutting inserted in a small pot full of sand, surrounded by Coconut fibre, placed over bottom heat, and covered with a bell-glass.

The figures are shown in section.

and press the new compost firmly round it. Grow the plants close to the light in the stove, avoid rushes of cold air, train the growths over a trellis, and syringe freely till the plants are in bloom. Allamandas may be grown as climbers, either in large pots or planted out. Apply water sparingly in the winter, and cut the shoots back freely before growth starts in the spring.

Principal Species :—

cathartica, Jy., yel. An Hendersoni, yel. (*syn*
infusion of the leaves of Schottii, var. Hender-
this species is a valu- soni).
able purgative. nobilis, Jy., yel.
Chelsoni, sum., yel. Schottii, Sep., yel.
— magnifica, yel.

Other Species :—

Aubletii (see cathartica). verticillata, Je., yel.
grandiflora, Je., yel. violacea, pur.
neriifolia, 3' Je., yel. Williamsii.
pardensis, yel.

Aleuritopteris (see *Cheilanthes*).

Aleyrodes proletella (see *Cabbage enemies*).

Alexandrian Laurel (see *Danaë Laurus*).

Alibertia (see *Dolia*).

Alisander (see *Alexander*).

Allantodia (see *Asplenium*).

Allardtia (see *Tillandsia*).

Alliaria (see *Sisymbrium*).

Alligator Apple (see *Anona*).

Alligator Pear (see *Persea gratissima*).

ALLIONIA.

A genus of hardy annuals (*ord.* Nyctagineæ) that thrive in light, sandy soil, and may be raised from seeds.

Only Species :—

involucrata, ann., pur., close to Marvel of Peru.

Allionia of Loefler (*see* Oxybaphus).

ALLIUM.

Description.—A large genus of bulbous plants (*ord.* Liliaceæ), comprising the Garlic, Onion, etc. The flowers are in heads or umbels, and many are of much value in the garden, though the odour of the majority makes them undesirable as cut flowers. The Onion is treated on under its own name.

Propagation.—By offsets removed when the plants are at rest; by seeds; and by the bulbils which many produce in the flower heads. The fault of a number is that they increase too rapidly. Sow seeds in spring.

Soil.—Any garden soil, not too heavy, is suitable for the Alliums. Neapolitanum, which is largely grown for forcing in pots, ought to have a compost of loam, sand, and leaf mould.

Other Cultural Points.—The greater number of the Alliums are perfectly hardy, but some of the species from California, the Mediterranean region, and Central Asia, should have a covering of 2" of dry litter in winter. Some make good pot plants for cool houses. Neapolitanum should be potted as soon as it can be procured, its treatment being the same as that for forced Tulips or Narcissi. Plant the other Alliums in early autumn.

Principal Species :—

acuminatum, 9", Jy., ro., in umbels. A desirable hdy. species.

ceruleum, 2', Je., sky bl., in globular umbels. A very beautiful species, but a little tender in cold districts where there is much rain in winter (*syn.* azureum). Cepa (*see* Onion).

— aggregatum (*see* Onion).

Moly, 1', My., yel., in showy heads. An old garden plant, indispensable in its season. neapolitanum, 1½', My., wh. This beautiful Allium can be had early by forcing in the same way as Narcissi.

ostrowskianum, 1', Jy., ro. A very neat species for the border or rockery.

roseum, 1', Je., pale ro. A good border flower.

triquetrum, 1½', Je., wh. A very graceful plant with heads of drooping flowers on triangular stems.

Other Species :—

Bidwelliæ, 9", Jy., ro.

falcifolium, 9", Aug., ro.

flavum, 10", Je., yel.

giganteum 4', Je., lil., pur.

kansuense, 6", Jy., bl.

karataviense, 1', My., wh.

macnabianum, 1½', Jy., magenta.

narcissiflorum, 1', Je., ro.

(*syn.* pedemontanum).

Many species of no garden value are omitted.

ALLOMORPHIA.

Dwarf stove plants (*ord.* Melastomaceæ). Few are in cultivation, and not many were known to science until M. Cogniaux described seventeen new

species in 1892. The only species here mentioned is a slow-growing but handsome plant, the green leaves being purple beneath. Peaty, sandy soil. Seeds or cuttings.

Principal Species :—

Griffithii, 2', Je., grn., wh.

ALLOPLECTUS.

These are mainly South American and Columbian evergreen shrubs (*ord.* Gesneraceæ) requiring the temperature of a stove; they are very attractive. Propagation by cuttings in very sandy soil. Compost, any light but fertile mixture. In this genus the calyx of each flower is strongly developed and of a brilliant hue.

Principal Species :—

capitatus, 2½', Mch., red,

yel.

concolor, 2', Mch., sc.

Lynchii, 2', Je., yel.

vittatus, 1½', Je., red, yel.

Other Species :—

bicolor, 1', Je.

chrysanthus, 1', Je., red,

yel.

dichrous, 2', Mch., yel.,

pur.

glaber, 1', Je., sc.

peltatus, 1', Aug., yel.

repens, Feb., yel., br. (climber).

Schlimii, 1½', Je., red, vio.

splendens, 1', Je., pur.,

yel.

zamorensis, 1', Ap., yel.,

or., red.

ALLOTMENTS.

A term applied to patches of garden ground hired and cultivated by artisans and labourers, but distinct from gardens attached to cottages. With the growing populations of large villages and small towns, particularly where labour is concentrated in manufacture, there is a steady demand for allotments, which are beneficial to working men in many ways. They afford a means of pleasant and profitable recreation for spare time, they supply the household with wholesome vegetables, and give opportunities of displaying horticultural skill that might otherwise remain dormant. In many instances ground is let for allotments by private landlords at rentals varying according to the situation and nature of the land; but since parish councils were given the power of acquiring land for the purpose, the area under allotment culture has increased considerably. Much encouragement is given to allotment holders by the technical education committees of county councils in providing instruction and prizes, and by local gardening societies.

When cutting up a field for allotments it is usual to lay out the plots parallel to each other, rectangular in shape, with pathways between, and one or more roadways through the field. The size of the individual plots varies from 10 to 20 square rods, each one being stumped off and numbered. Twenty rods is generally a suitable size. In some instances the plots are confined solely to the cultivation of vegetables, on others fruit and flowers are grown as well, and on others again the tenants erect pigsties in one corner, and in some cases summerhouses and small glass structures.

The shape of the average rectangular plot of allotment ground is favourable to rotation of cropping, and the aim of the cultivator should be to obtain a large quantity of useful produce in succession. A glance at the plot shown in the illustration on page 29 will indicate how such a piece of ground may be profitably cropped, and it is so arranged that vegetables differing in character of growth can have a fresh position each year. An

allotment of the size and character illustrated should have eight rows of first early Potatoes planted 2' apart, to be followed by Winter Greens; twelve rows of a medium-growing second early variety at 2½' apart, with Greens planted between the rows; and fourteen rows of main crop Potatoes at 3' apart. There should be nine rows of Onions, three of Shallots, six of Carrots, three of Beet, and four of Parsnips. To insure Green Cabbages for

a bed of Marrows, and another of Cucumbers, and it is well to have a few clumps of Rhubarb, a patch of mixed herbs, and a row or two of Artichokes. Tomatoes, pickling Cabbages, and Spinach are useful extra crops, and vacant spaces may be occupied by successional sowings and plantings of salads. Where fruit is grown in allotments it may be represented by rows of Gooseberries, Currants, and Raspberries, a small bed of Strawberries, and a few bush Apples on a dwarfing stock. Most allottees like to brighten their plots with a few flowers, and standard Roses and Dahlias are grown by the sides of the paths, with patches of hardy annuals where space can be spared.

Heavily cropped allotments need deeply cultivating and well manuring. The benefits of liberal dressings of stable manure are well known, and allottees are learning to recognise the value of phosphatic, potassic, and nitrogenous fertilisers in concentrated forms.

ALLUVIAL SOIL.

The most fertile of all soils is the deposit of decomposed vegetable matter, animal excrement, and finely broken-up earths washed down from hills and mountains, which is allowed by the slower action of the water to settle in the valleys, at lake bottoms, river deltas, etc. From time immemorial Egypt has cultivated enormous food supplies along the Nile valley in the annual deposits of alluvial soil (mud) made when the great river overflows.

ALMEIDEA.

Brazilian evergreen shrubs (*ord.* Rutacæ) that require the temperature of a stove. Propagation by cuttings of half-ripened wood in very sandy soil under a bell-glass. Soil, loam, peat, and sand.

Principal Species:—

rubra, 12', Sep., red.

ALMOND.

Familiar ornamental trees, valuable from their early blooming. Owing to their cheerful appearance in early spring they are well worth planting in shrubberies, and they are not very fastidious as to soil or situation, thriving in town suburbs. (*See also PRUNUS.*)

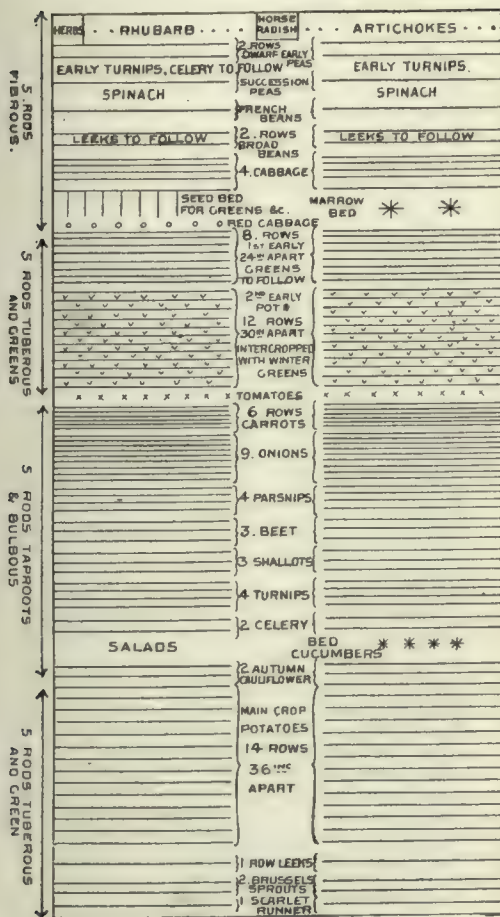
ALNUS. (ALDER.)

Useful trees and shrubs (*ord.* Cupuliferae), with monoecious (*see* Glossary) flowers in catkins, and roundish leaves. Generally propagated by seeds, but also by cuttings, suckers, and grafting. The native *glutinosa* likes a moist soil, but the other species thrive well in one of good quality which is well drained.

Principal Species:—

glutinosa, 60', the well-known Alder, a valuable tree as a shelter by the seaside, and also for planting in damp situations where few other things will thrive. There are a number of excellent varieties, among the best being *aurea*, foliage yellow; *imperialis*, with lobed leaves; *lacinata*, with drooping habit and cut foliage; *quercifolia*; and *incisa*. These are very pleasing forms.

incana, 9' to 20', a pretty little tree with oval leaves which have the under surface whitish in



PLAN OF ALLOTMENT OF 20 SQ. RODS; 55 YARDS LONG AND 11 YARDS WIDE.

the spring plant four rows the previous autumn, and for succession sow in the spring and plant in vacant ground as early summer crops are removed. Three rows of Peas in succession will provide a supply of this delicious vegetable; and in the way of Beans, two rows of Broad, one row of dwarf French, and one row of Scarlet Runners will suffice. Winter Greens may be represented by Brussels Sprouts, Savoy, and Kale, with Broccoli for succession. These can be raised in a small nursery bed, and be planted between Potatoes, and in vacant ground as early crops are removed. Provision should be made for a few rows of Celery and Leeks for the winter. Space must be provided for

Allspice (*see Calycanthus*).

Allspice tree (*see Pimenta*).

Alnaster (*see Alnus*).

colour. There are a number of forms of this, *pendula nova*, of weeping habit, being effective. *pinnatifida* is another var.

Other Species :—

<i>acuminata</i> .	<i>nitida</i> , 100'.
<i>cordifolia</i> , 20'.	<i>rhombifolia</i> , 20'.
<i>firma</i> , very distinct.	<i>rubra</i> , 20'.
<i>japonica</i> , a large tree.	— <i>oregana</i> .
<i>nepalensis</i> (<i>syn.</i> <i>Clethropsis nepalensis</i>).	<i>viridis</i> , 20'.

ALOCASIA.

Description.—This is a genus (*ord.* Aroideæ) of considerable importance, on account of the handsomeness of the foliage of the principal species



ALOCASIA THIBAUTIANA.

and the garden hybrids. They are stove plants, and require the moist atmosphere of that structure to fully develop the beauties of their leaves. The spikes of inconspicuous flowers should not be allowed to develop.

Propagation.—Stock is easily increased by dividing the rhizomes in March, and placing them in sandy soil in a hot and moist propagating case.

Soil.—A well drained compost consisting of fibrous loam, small lumps of charcoal, coarse sand, and peat, suits them admirably.

Other Cultural Points.—Some of the species enter largely into the decoration of rooms, for which they are admirably suited, but errors in watering often lead to the loss of the lower leaves. The drainage must be perfect. If the plants are placed in dark corners they soon assume a sickly hue, and require to be removed at once.

Principal Species :—

cuprea, 1½', pur., wh. (*syn.* *metallica*).
illustris, 2', grn., blk.
longiloba, 1', grn., wh. (*syn.* *amabilis*).
Lowii, 2', grn., wh., pur. (*syn.* *Veitchii*).
sanderiana, metallic bl., wh.
zebrina, 1½', grn., wh., pur.

Other Species :—

<i>alba</i> , 1½', wh.	<i>Lindenii</i> , 2', grn., pur.
<i>augustiana</i> , 2', br. grn.	<i>macrorhiza</i> , 4', grn., wh.
<i>cucullata</i> , 2', grn., wh.	<i>Margaritæ</i> , 2', dark grn.
<i>eminens</i> , 3', dark grn., pur.	<i>marginata</i> , 3', dark grn.
<i>guttata</i> , 2½', wh., pur.	<i>Sedenii</i> , 2', grn., pur., wh.
<i>indica</i> , 2', wh., grn.	(<i>hyb.</i> <i>cuprea</i> × <i>Lowii</i>).
<i>Liervalii</i> , 1½', br., grn.	<i>thibautiana</i> , 3', grn., grey, pur.

ALOE.

Description.—A genus of ornamental plants (*ord.* Liliaceæ), of great value for the decoration of the conservatory, or for sub-tropical effects in the garden in summer. Their succulent leaves, which are often arranged in a rosette, are very handsome, and diversity is secured by some having long stems, while others are stemless. They should be more



Photo: H. B. Cooper, Leicester.

A TALL ALOE.

grown by amateurs possessing glass structures with a little heat. Several of the best known species do well in windows if kept clean. The greater number are natives of South Africa.

Propagation.—By suckers or seeds, the latter being sown in heat.

Soil—Loam, peat, and sand in about equal proportions, with the addition of a little brick rubbish and decayed manure.

Other Cultural Points.—A temperature of 40° to 50° will suit nearly all the species in winter. At that season water must be supplied sparingly and with judgment, but in summer liberal supplies are needed, so that it is necessary for the pots or tubs to be well drained. Plants to be placed outside in summer ought not to be put out until all danger from frost is over, and must be housed before its return.

Principal Species :—

abyssinica, yel., leaves 2½ long. An old Aloe which has several varieties, including *glauca*, *maculata*, *recurvata*, etc.

albisipina, red, leaves broad, grn., with wh. prickles.

humilis, bright red, close rosette of glossy grn. leaves with pale grn. prickles. There are several varieties of this species.

mitraformis, bright red, leaves glaucous and without spots, prickles pale grn. There are several varieties, including *flavisipina*, which has yel. spines.

striata, red, with glaucous leaves, which are finely lined and spotted, the margin being banded with wh. and red (*syn. albocincta*).

succotrina, red, leaves glaucous, in a dense rosette.

variegata, red, leaves grn., with wh., toothed margin. The variegated Aloe often seen.

vera, yel., in a dense raceme. A fine plant, very effective in or out of doors.

Other Species :—

aficana, yel.
arborescens, red, leaves
glaucous.
aristata, red.
aurantiaca, yel., red.
Bainesii, red, tree-like
(*syn. Barbery* and
Zeyheri).
brevifolia, red.
caesia, red.
ciliaris, red.
Cooperi, red.
dichotoma, red.
distans, pale red.

glauca, red.
Greenii, red.
insignis, wh.
latifolia, sc.
longiflora, pale yel.
nobilis, red.
penduliflora, yel.
Perryi, wh.
saponaria, red.
Schimperi, red.
Schweinfurthii, or. yel.
serrulata, red.
striatula, yel.
tricolor, red.

There are many others.

ALOMIA.

An evergreen (*ord. Compositæ*) that is suitable for outdoors in the summer, but must have greenhouse protection in winter. Propagation by cuttings; soil—light loam.

Only Species :—

ageratoides, 1½, Jy., wh.

ALONA.

A small group of semi-shrubby Chilean plants (*ord. Convolvulacæ*), needing greenhouse protection, and flowering in July. A compost of peat and loam is necessary; cuttings root freely in sandy soil.

Principal Species :—

cœlestis, 2', Jy., bl.

ALONSOA.

Evergreen greenhouse plants or half-hardy annuals (*ord. Scrophularinæ*). Fertile soil is necessary. Increase in the one case by cuttings inserted in spring, in the other by seeds sown in warmth in February or March. Several garden forms with specific titles are now popular as half-hardy annuals.

Seed may also be sown thinly in the positions where the plants are to flower, a little thinning and staking being all the subsequent attention necessary. If raised under glass they may be potted on and planted out about the end of May.

Principal Species :—

incisifolia, 2', Jc., sc.

Warscewiczii, 1½, Jy., sc.

Species Grown as Annuals :—

gracilis, 1', Jy., red.

Mutisii, 1½, Jy., pk.,
crim.

linearis, 1½, Jy., sc.

limifolia, 1½, sc.

Warscewiczii compacta,
1', Jy., sc.

ALOPECURUS.

The Fox-tail Grasses (*ord. Gramineæ*) are exceedingly useful for pastures, and by no means devoid of beauty. Quite hardy; any garden soil.

Principal Species :—

arundinaceus, 3', Jy.

pratensis, 2', Jy.

pratensis variegatus, 2', Jy.

ALOYSIA. (LEMON-SCENTED VERBENA, *see LIPPIA*.)

ALPINE GARDEN.

The Alpine garden is the place devoted to the cultivation of those dwarf-growing plants which are, for convenience' sake, called Alpine flowers,

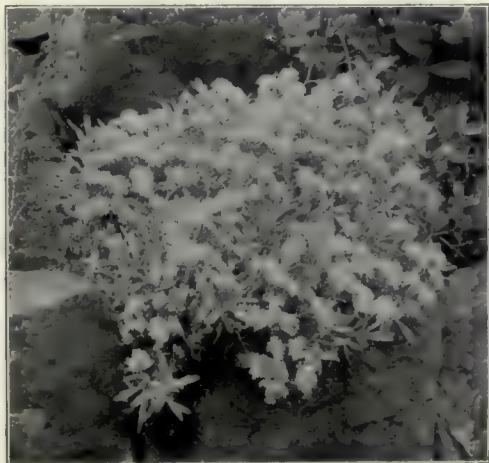


Photo: D. S. Fish, Edinburgh.

A CORNER IN AN ALPINE GARDEN: THE PLANT SHOWN IS
ALYSSUM SPINOSUM.

although many of them are not natives of Alpine regions, and may even come from close to the sea level. Nor are they limited to plants of any

particular habit of growth, as the modern Alpine garden now includes herbaceous plants, in the popular sense of the term, bulbous plants, shrubs, and annuals. It is obvious, therefore, that the place in which these are to be grown should be adapted to the cultivation of plants of very varied requirements in the way of soil, position, and exposure. How to attain the ideal position for the plants requires much consideration from those about to embark upon the cultivation of Alpine flowers.

Alpine gardens are of many kinds. The wealthy man may have a large and picturesque rock garden, imitating Nature in the arrangement of the stones of which it is constructed, or built of some of the substitutes for stone which the skill of practised rockwork builders can fashion into a perfect imitation of rocks, but often better adapted for growing the plants than one made of natural stone, and capable of making a finer effect by reason of having an increased number of crevices in which to plant the flowers. The poorer man may content himself with rockeries on a less ambitious scale, constructed of smaller stones in terraces on which the plants are grown—often better, indeed, than on more elaborate erections. Those, again, who have but a short tenure of their gardens, or who live in districts where stone is scarce, may grow many beautiful things in a little rock bed, made of a raised bed of good soil, edged with stones, and having a number of a larger size partially inserted in the soil here and there on the bed. In such a bed many choice flowers can be grown as well as on the extensive rockery.

The engravings which accompany this will show that formality must be avoided in constructing the various kinds of Alpine gardens. In an extensive one, where expense is no object, or at most a secondary consideration, it is advisable to entrust the work to men of experience. Where these sometimes err is in allowing too few "pockets" for the plants to be placed in.

As far as possible, the stones ought to be arranged in their natural position. This is not always easy, but careful planting will take away the artificial appearance of the commonest and cheapest rockery, even if only built of slag dipped in cement. In the construction of a rockery a free root-run for the plants must always be given, and those which do not travel far for food can easily be provided for afterwards by restricting this. Ample drainage is also necessary, and the crevices should be so arranged that surplus water can pass freely away. Even if a plant requires an overhanging rock or stone to keep its foliage dry, it ought to have a way by which the rain can pass freely to its roots. Thus the crevices for the plants should always run down, and not up, as is sometimes the case. For small, or even large, rockeries, a series of terraces is the best general arrangement.

While the body of soil may consist of almost any kind of a free and porous nature, the places in which the flowers are planted must be filled with compost suited to their respective wants. A light loam, with the addition of grit and leaf mould, will do for most Alpines; those which require a special compost can be accommodated with what they want by filling their "pockets" with suitable soil.

In planning an Alpine garden it ought to be borne in mind that a variety of aspect is essential if a varied collection is to be grown. Some flowers

like full sun, but others need whole or partial shade. Even in a rockery with one exposure, these may be secured by the construction of little bays, or even by the skilful interposition of large stones between shade lovers and the sun. At the base, plants needing moisture can be accommodated with a little bed of moist peat, and a small cement basin filled with aquatic plants would be a gain to many Alpine gardens. (*See Aquatics.*) Those who cannot give Alpine flowers such places as are indicated may be able to grow a great many satisfactorily in a frame, the plants being cultivated in well-drained pots and given plenty of air as constantly as possible. The pots should be plunged in sand or ashes. Many choice Alpines thus well repay the care of the cultivator which can only be grown satisfactorily in our climate in pots in a frame.

To those who can afford it, a low house for Alpine flowers will give much pleasure, especially early in the year, when inclement weather is destructive to the earliest flowers in the open, or makes it disagreeable for the owner to stay outside. A low span-roof house, with or without heating apparatus, will be the most suitable, and will prove a delightful adjunct to the outdoor Alpine garden.

Many Alpines, especially those with silky, hairy, or woolly foliage, suffer much from rain and sleet in winter. These must have protection from wet at that season, and there is no more convenient way of giving it than by fixing, an inch or two above the plant, a sheet of glass, a slate, flat stone, or even a thin board. Useful wire supports for glass are made for sale, and are both convenient and durable.

Perhaps the greatest of all the enemies to the success of the Alpine garden is the slug, which finds in its crevices many hiding places, whence he can sally forth at night. There is nothing so effectual as hand-picking, but, to preserve special plants, a zinc ring with a notched upper surface is a good defence. Still better is one made of fine brass wire gauze, such as is used for sieves. A regular search under plants which slugs frequent for hiding places will diminish their numbers.

Autumn or early winter is the best time to construct an Alpine garden, as the winter rains will settle the soil before planting, which is best done in spring. In planting, see that the roots are firmly planted and well jammed into the crevice, without, however, being injured.

An important point in the Alpine garden is that of top-dressing. Many plants are destroyed from want of this, and it is always safer to have a periodical inspection and supply the requirements of the flowers in this respect. Loam, grit, and leaf mould will make a good compost for this purpose.

There are so many plants available for the Alpine garden that only suggestive lists of the leading plants for different positions can be given. For details reference can be made to the paragraphs relating to these genera.

For South Exposures :—

Acæna, *Acantholimon*, *Adonis*, *Æthionema*, *Alsine*, *Alyssum*, *Androsace*, *Anemone* (some), *Antennaria*, *Anthemis*, *Arabis*, *Arenaria*, *Armeria*, *Astragalus*, *Aubrietia*, *Campanula*, *Cheiranthus*, *Cistus*, *Coronilla*, *Cytisus*, *Dianthus*, *Draba*, *Edraianthus*, *Erysimum*, *Genista*, *Geranium*, *Globularia*, *Gypsophila*, *Helianthemum*, *Hypericum*, *Iberis*, *Iris*, *Linum*, *Oenothera*, *Onosma*, *Orobis*, *Phlox*,

Potentilla, Saponaria, many Saxifrages, Scabiosa, Sedum, Silene, Thymus, Veronica, Waldsteinia, Yucca, etc.

For South-east or North-west :—

Ajuga, Andromeda, Anemone (several species), Aquilegia, Armeria, Arnebia, Campanula, Daphne, Dodecatheon, Epimedium, Gentiana, Hepatica, Linaria, Myosotis, Primula, Ranunculus, Saxifraga, Sedum, Silene, Soldanella, Symphyandra, Wulfenia.

In deep Shade or under Trees :—

Astrantia, Anemone (several), Andromeda, Chelidonium, Chrysosplenium, Corydalis, Cardamine, Doodia, Epimedium, Eriogonum, Eomecon, Epilobium, Euphorbia, Funkia, Gaultheria, Helleborus, Hepatica, Horniminum, Orobis, Podophyllum, Polygonatum, Saxifraga of Geum types, Sisyrinchium, Sedum, Thalictrum, Tradescantia, Tiarella, Trillium, and Waldsteinia.

ALPINIA.

Strong-growing East Indian plants (*ord.* Scitamineæ) requiring rich soil, and plenty of heat and moisture while growing freely. They are closely allied to the Gingers, and like them can be increased by division of the fleshy rhizomes. The flowers of some species are exquisitely beautiful, resembling *Phaius tuberosus*, and were they produced with greater regularity and freedom the genus would be more largely represented in our hothouses.

Principal Species :—

Allughas, 2', Feb., red. nutans, 6', My., pk., yel.
mutica, 5', Aug., wh., red, yel.

Other Species :—

bracteata, 3', My., wh. officinarum, 3', My., wh.,
cerulea, 3', Ap., wh., bl. yel.
calcarata, 3', Ap., pk., wh. pumila, 2', My., wh., yel.
cernua (*see calcarata*). rafflesiana, 3', My.,
Galanga, 6', Oct., wh., yel. striped (*syn.* vittata).
malaccensis, 5', Ap., wh.

Alsike (*see Trifolium hybridum*)

Alsine (*see Arenaria*).

ALSODEIA.

Dwarf evergreen shrubs (*ord.* Violaceæ) needing a warm house, and a compost of peat and loam. Increased by cuttings in sandy soil, in a close, warm frame. No horticultural value.

Principal Species :—

latifolia, 3', Jy., wh. pauciflora, 3', Jy., wh.

ALSOMITRA.

An evergreen climber (*ord.* Cucurbitaceæ) requiring a rich compost and a hot, moist atmosphere. When flowering and fruiting it requires abundant supplies of water.

Only Species :—

sarcophylla, 15', Oct., wh.

ALSOPHILA.

Description.—Tree Ferns (*ord.* Filices) of varying heights, from tropical and temperate latitudes. Comparatively few species are in general cultivation, as the plants can only be accommodated in large and lofty houses.

Propagation.—By spores sown when ripe in pans of sterilised soil in heat.

Soil.—For the young plants equal parts of peat and loam, with sand; for the older ones, three-fourths loam, and one-fourth peat or leaf soil, with sand, and a little charcoal.

Other Cultural Points.—All the members of the genus require plenty of water at all times, although the use of the waterpot should be restricted in winter time in the case of the cool-house species. Liquid cow manure and soot form a very grateful stimulant through the spring and summer. Mealy bug, thrips, and snowy fly all prey upon *Alsophilas*. An occasional light fumigation should be resorted to in order to keep these pests down, and the frequent use of the sponge is necessary. Where the young fronds are pushing against the glass, as they often do in all but the loftiest houses, it is necessary



A VIEW IN AN ALPINE GARDEN.

to attach weights to the midribs to bring them down. Many a fine specimen has been spoiled for the time being by inattention to this matter.



ALSOPHILA ACULEATA.

Principal Species :—

- | | |
|----------------------------------------------|-----------------------------------------|
| <i>armata</i> , 3' to 5', st. | <i>paleolata</i> , 10' to 20', |
| <i>aspera</i> , 6' to 8', fronds | fronds 3' to 6', st. (<i>syn.</i> |
| 3' to 6', st. | <i>Gardnerii</i>). |
| <i>comosa</i> , 3' to 6', grh. (<i>syn.</i> | <i>Rebecca</i> , 8', fronds 4' to |
| <i>scottiana</i>). | 6', grh. |
| <i>excelsa</i> , 6' to 8', fronds | <i>scottiana</i> (<i>see comosa</i>), |
| 3' to 9', grh. | |

Other Species :—

- | | |
|--------------------------------------------|---------------------------------------|
| <i>aculeata</i> (<i>see ferox</i>). | <i>infesta</i> , 3' to 4', st. |
| <i>atrovirens</i> , fronds large, | <i>leichardtiana</i> , 10' to 20', |
| st. | grh. (<i>syns.</i> <i>Macarthuri</i> |
| <i>australis</i> , 3' to 4', grh. | and <i>Moorei</i>). |
| — <i>Williamsii</i> , 3' to 4', | <i>lunulata</i> , 20', grh. |
| warm grh. | <i>philippinensis</i> , |
| <i>contaminens</i> , 3' to 6', st. | <i>plumosa</i> . |
| (<i>syn. glauca</i>). | <i>procera</i> , 3' to 5', st. |
| <i>Cooperi</i> , 3' to 5', st. or | <i>pruinata</i> , 3' to 6', st. or |
| grh. | grh. |
| <i>denticulata</i> . | <i>pycnocarpa</i> , grh. |
| <i>elegantissima</i> . | <i>radens</i> , 3', st. or grh. |
| <i>ferox</i> , 3' to 4', st. (<i>syn.</i> | <i>sagittifolia</i> , 4' to 6', st. |
| <i>aculeata</i>). | <i>Shepherdii</i> , st. |
| <i>gigantea</i> (<i>see glabra</i>). | <i>Tanitis</i> , 3' to 6', st. |
| <i>glabra</i> , 20' to 40', st. | <i>villosa</i> , 6' to 12', st. |

ALSTONIA.

East Indian evergreen shrubs (*ord.* Apocynaceæ), seldom cultivated. Easily grown in a stove, in a compost of loam and leaf soil. Propagation by cuttings in sandy soil, with bottom heat.

Species :—

- | | |
|---------------------------------|--------------------------------|
| <i>scholaris</i> , 8', My., wh. | <i>venenata</i> , 6', Je., wh. |
|---------------------------------|--------------------------------|

ALSTRÖMERIA.

Description.—Remarkably ornamental plants (*ord.* Amaryllidæ) with tuberous roots, in bundles, and giving flowers of great beauty and value, either in the garden or for cutting. Mr. J. G. Baker describes forty-four species, but the number available for cultivation is much smaller. Several are hardy almost throughout the kingdom, but some require to be grown in pots, while a few others will survive outside if protected in winter. The flowers are singular in form, and in some plants in colour also.

Propagation.—By seeds, sown in spring or when ripe, in pots or boxes under glass. When the seedlings are large enough to handle they must be pricked out 2" apart, and when of fair size planted in their permanent positions. They are also propagated by division of the mass of tubers in spring.

Soil.—A warm, sheltered border, well lightened with leaf mould or peat and sand, is the most favourable, but several are benefited by the addition of lime rubbish. The same soil is suitable when grown in pots.

Other Cultural Points.—During summer, Alströmerias should have ample supplies of water, and those grown in borders are all the better for a mulch in dry weather. In winter they should have a covering of 2" or 3" of dry litter. Spring is the best time for planting in the open, and tubers received late ought either to be potted or kept in



ALSTRÖMERIA PELEGRIINA ALBA.

sand in a place free from frost. Plant at least 6" deep.

Principal Species :—

aurantiaca, 4', Jy., or. One of the hardiest, soon spreading through a border if not kept in bounds. Variable in colour; a good light coloured form is named *lutea*.

chilensis, 3', Jy., ro. to red and or. Hdys., variable and beautiful. Not so running in habit as the preceding.

Ligtu, 2', Aug., lil., pale red, or creamy. A beautiful but rather tender species.
 pelegriua, 1½', Jy., yel., striped ro. A very beautiful but tender plant. Should have protection, or be grown in pots under glass. The var. alba, introduced in 1877, is exquisite (*syn.* peregrina).
 pulchella, 6', Aug., crim., pur., grn. A distinct plant, not so bright as some of the genus. Hdy.

Other Species :—

brasilensis, 3½', Jy., red-dish yel., brown.	hamantha, 3', Je., hdy. with covering, yel. (<i>syn.</i> Simsii).
Diazii, 2½', Jy., or. red.	spatulata, 2' Aug., red.
Erreimbaultii, 2', Jy., wh., crim., yel. (a hybrid).	

ALTERNANTHERA.

Description.—Effectively coloured foliage plants (*ord.* Amarantaceæ) of great beauty for carpet and other bedding. They are called half-hardy, but are too tender even for summer use in cold districts.

Propagation.—By cuttings in heat. A hotbed being the most convenient, with a bottom heat of 75° to 85°. Place 4" of sandy soil on the surface, in which insert the cuttings 1" apart. Water well, and keep close and shaded for a week, afterwards giving full sun, with air to harden them off. Plant out when the weather is warm enough. A few plants can be kept in pots during winter for stock in spring. A warm house is needed.

Soil.—A rich, light soil which will not induce gross growth is the best.

Other Cultural Points.—Plant in a warm sunny place, and keep pinched as may be needed to suit the purpose required.

Principal Species :—

amabilis (now referred by botanists to *Telanthera ficoidea*), leaves or., sc. Var. amœna is or. red, pur., bronze, grn. Tricolor is dark grn., ro, pur., yel.

paronychioides (now referred by botanists to *Telanthera bettzichiana*), 4", dark br., tipped sc. Var. major is even brighter, and *m. aurea* has fine yel. and red foliage.

ALTHÆA. (MALLOW.)

Description.—Biennial or perennial plants (*ord.* Malvaceæ), mostly of coarse-growing habit, the most valuable for the garden being rosea, the Hollyhock, which is dealt with under that name.

During the last few years a new race has been raised from *ficifolia*, the Fig Leaved or Antwerp Hollyhock. These plants have the handsome foliage of the parent, and prettily fringed flowers. So far only shades of yellow and a white have been obtained, but other colours will almost certainly be forthcoming soon. As is usual with plants raised from seed, the vigour of growth is very marked, and there is little danger of disease.

Propagation is by seeds, sown in spring or summer, varieties by cuttings or eyes and division of the roots. A good, well-manured loam suits. The greater number of the Althæas are most suitable for the back of the border, the shrubbery, or the wild garden. Water well in dry weather, and stake as soon as necessary.

Principal Species :—

cannabina, 6', Je., deep ro. A good plant for the shrubbery or wild garden; per.
 ficifolia, 6', Je., yel. One of the most useful. There is also a wh. var. *Bien.* (*syn.* sulphurea of gardens).

narbonensis, 6', Jy., red. A per. species of some value.

Other Species :—

acaulis, 2', Jy., ann., pur.	officinalis, 3', Jy., flesh,
caribæa, 3', spr., st., pk.	the native Marsh Mal-
flexuosa, 3', Jy., per., pk.	low.
frutex (<i>see</i> Hibiscus syriacus).	striata, 5', Jy., bien., wh.

ALTINGIA.

Tall growing trees (*ord.* Hamamelidæ) from the Far East; closely allied to the Liquidambar. Greenhouse protection is necessary in this country. The only species in cultivation is *chinensis*, and it is of no horticultural value.

ALTITUDE.

The elevation above sea level at which plants grow has a great deal to do with their habit, consequently if it is known at what altitude a certain plant is found growing in a particular part of the globe, an idea, though, be it said, not a strictly reliable one, can be formed of its requirements in this country. The greater the altitude the cooler and drier the atmosphere becomes. As a general principle it may be laid down that species growing at an altitude of over 7,000' at the equator should not need protection in the south of England and Ireland. Some *Oncidiums* in America, and some *Pleiones* (*Cœlogynes*) in Northern India, grow at such an elevation that they are not infrequently under the influence of frost during the cool season. These naturally require little artificial heat in this country, save when growing freely. Altitude produces pretty much the same climatic conditions as latitude—i.e. roughly speaking, 600' rise at the equator ensures a climate somewhat similar to that found 1° of latitude from the equator. A further rise of 600' would be equal to 2° of latitude from the equator, and so on.

In this country the question of altitude is of considerable importance to the fruit grower, especially where Plums and other stone fruits are concerned. In low-lying valleys frosts are usually more severe, and, with the greater moisture prevailing in the atmosphere, more destructive than they are upon the uplands. Generally speaking, a height of about 500' above sea-level is the best for hardy fruit, as it is high enough to escape the effect of the frosts, and not high enough to be too much exposed. Timber grown at a moderate elevation, such as that mentioned, is more durable than that grown in the valleys.

ALYSSUM. (MADWORT.)

Pretty perennial or annual plants (*ord.* Cruciferae), principally of a shrubby nature, and suited for beds, borders, and rockeries. Propagated by cuttings, seeds, and division of roots. Cuttings of young shoots, with or without a heel of old wood, strike under glass in a shady border. Sow seeds in spring or early summer. A light dry soil is best. Most of the species require full exposure to the sun. The Alpine species do best in a sunny chink of the rockery.

Although the plants are usually only to be found in rock gardens, they do very well in an ordinary herbaceous border, provided they are not overhung by other and coarser growing plants, and that the border is well drained. They should be given a place in the front rank, and look best when planted in bold clumps. As an edging to beds filled with other spring-flowering subjects Alyssums have also a claim.

Principal Species :—

alpestre, Je., yel. Pretty rockery per., foliage greyish.

gemonense, 1', My., yel. Not so dense as saxatile, but longer in bloom. Rather tender, but sows itself. The variety sulphureum is desirable (*syn. Vesicaria edentula.*)

maritimum, 9", Ap., wh. A favourite sweet-scented ann. which sows itself freely. The var. variegatum (propagated by cuttings) is very pretty in lines (*syn. Königa maritima.*)

montanum, 2", Je., yel. A pleasing, rather diffuse Alpine with glaucous leaves.

saxatile, 1½', Ap., yel. The most effective of the genus; valued for spring bedding. There are several varieties, such as nanum compactum, of neater habit; flore pleno, double golden yel.; variegatum, with variegated foliage; sulphureum, with sulphur flowers; and Tom Tuumb, of very dwarf habit.

spinosum, 4", My., wh. A charming little wh. leaved plant for the rockery (*syn. Königa spinosa.*)

Wierbeckii, 1½', Je., yel. Erect habit, and deep coloured flowers.

Other Species :—

argenteum, 9", Ap., yel.

micranthum, 1', Jy., yel.

orientale, 1', My., yel.

podolicum, 4", Mch., wh.

(*syn. Schivereckia podolica.*)

serpyllifolium, 4", My., yel.

ALYXIA.

Shrubby warm house plants (*ord. Apocynaceæ*), evergreen. Seldom cultivated, but may be grown in light loam, leaf soil, and sand. Cuttings of ripened wood root readily in sandy soil if plunged in bottom heat.

Species :—

buxifolia, 4' Aug., wh.

daphnoides, 3', Ap., yel. wh.

Forsteri, 4', Je., wh.

ruscifolia, 4', Jy., wh.

ALZATEA.

A greenhouse tree (*ord. Celastrineæ*) apparently not now in cultivation. Peaty soil.

Species :—

verticillata, 20', ev.

AMANITA.

A fungus closely allied to Agaricus, but including some of the most poisonous of fungi. The Fly Agaric is a native species with a scarlet pileus covered with white warts. It is common in Beech woods in autumn, and derives its name from the fact that formerly it was used in the preparation of flypapers.

AMARABOYA.

Stove evergreen shrubs (*ord. Melastomaceæ*), propagated by cuttings kept close in bottom heat, and thriving in a compost of three parts loam, one peat, and a dash of sand.

Species :—

amabilis, pk., wh. princeps, car. splendida, red, pk.

AMARANTH, GLOBE.

The plant known as the Globe Amaranth (*see also GOMPHRENA*) is Gomphrena globosa, a pretty and valuable half-hardy annual with roundish "everlasting" flowers, which are valued for bouquets and decorative purposes in winter. The colours vary from white to several shades of yellow, pink, crimson, and purple. It grows about 1½' high



Photo: D. S. Fish, Edinburgh.

ALYSSUM SAXATILE AT HOME.

but there is a dwarf form which is only from 4" to 6" in height. It requires the same treatment as other half-hardy annuals, and may be grown in beds or borders, as well as in pots in the conservatory.

AMARANTHUS.

Handsome hardy or half-hardy annuals (*ord.* Amarantaceæ) with small flowers in large clustered spikes, and largely used for bedding, conservatories, and vases. Propagated by seeds sown about the month of April, in hotbeds in the case of the half-hardy species, and later in the open for the hardier Amaranthuses. A good loam, well enriched with decomposed manure, is best. When the young plants are large enough to handle, thin out, and afterwards harden off and transplant early in June, or at the end of May, to where they are to bloom, in sunny beds or borders. Plants in pots must have plenty of room, and should be kept steadily growing in a moist atmosphere and near the glass.

Principal Species :—

caudatus, 3', Aug., hdy. ann., pur. The popular "Love-lies-bleeding" of gardens. Also a yel. var. *hypochondriacus*, 3', Jy., crim. The "Prince's Feather." A fine plant (*syn.* *cruentus*). *melancholicus ruber*, 1', Jy., leaves crim. A useful bedding plant (*syn.* *gangeticus ruber*). *salicifolius*, 3'. A handsome and brilliantly coloured foliage plant. The var. *Princess of Wales* is very fine.

speciosus, 4½', Jy., crim. pur.

tricolor, 1½', beautiful car. and yel. leaves. Several vars.

Other Species :—

bicolor, 2', leaves grn., yel. *sanguineus*, 3', Jy., pur. : leaves red.
Henderi, 3', leaves finely coloured or., yel., grn. *splendens*, 3', Jy., red leaves, brilliant.

NOTE.—The popular nomenclature is adopted here ; not that of some botanists.

AMARYLLIS.

(*Ord.* Amaryllideæ.) If all the plants somewhat vaguely referred to by this name were treated under the heading there would be a very long list indeed. There are, for instance, *Brunsvigias*, *Crinums*, *Hippeastrums*, *Nerines*, *Phycellas*, *Sprekelias*, *Sternbergias*, *Vallotas*, and *Zephyranthes*, all of which are sometimes spoken of as Amaryllises, but are treated separately in this work under their own names. For the purposes of a popular gardening dictionary it is thought desirable to refer to as Amaryllises the beautiful spring-flowering indoor bulbous plants (technically *Hippeastrums*) grown under that name, and deal with the rest under their respective headings. A few species are deserving of cultivation, and from these a large number of beautiful hybrids have been obtained, which eclipse the species in point of beauty.

Propagation.—By offsets and seeds. The former are taken off when potting, and grown on the same lines as established plants till they arrive at a flowering size (*see figure*). When the latter method is adopted the seed should be sown as soon as it is ripe in shallow pans filled with loam and leaf mould in equal parts, with sufficient sand to keep it open (*see figure*). Place the receptacles in a temperature ranging from 60° to 70°, shading from hot sunshine. When the seedlings appear provide plenty of light and moisture. It is well for them

to remain in the seed pans until they have made a few leaves, when they should be removed singly to small well-drained pots, using soil of the same character as for the seeds, but a little rougher. Seedlings do not require to be rested in the early stages of growth, and if kept green through the autumn with limited supplies of water they start vigorously in the spring, and may be had in flower two to three years from the time of sowing the seed.

Soil.—For small seedlings equal parts of fibrous loam and leaf mould, with enough sand to keep the compost open. For established plants, two parts loam, one part decayed manure, and half a part sand.

Other Cultural Points.—Established bulbs that have been rested through the winter should be shaken out early in the year and repotted. Pot firmly, and leave about half the bulb above the soil. A low pit, with an intermediate temperature, is a suitable structure for newly potted plants. They should be plunged in Coconut fibre refuse.



PROPAGATING AMARYLLISES (HIPPEASTRUMS) FROM SEEDS AND OFFSETS.

A Section of pan with seeds sown and covered with square of glass.
B Early growth of young seedlings.
C Seedling with bulb partly formed and ready for potting.
D Seedling in small pot.
E Large bulb showing growth and production of offsets.
F Small offset bulb removed.
G Section of pot showing offset potted and started into growth.

Use the syringe freely, but water sparingly until growth has started and root action is vigorous. When the plants are in full growth, and becoming rootbound, liquid manure and top-dressings of fertilisers may be given with advantage. After the flowering is over, and as growth is completed, give less water both at the roots and overhead, finally withdrawing supplies entirely as the leaves change colour and fall from the bulbs. Keep the latter dry through the winter in a temperature of from 45° to 50°, resting them in the soil till the time arrives for repotting early the following year.

Hybrids and Varieties :—

Since the attention of hybridisers was turned to this family of plants a large number of varieties have been raised, and the work still goes on. The

following selection is compiled from recent introductions :—

Acidalie, light sc.	Juno, or scar., wh. star.
Averunicus, red, wh. stripes.	Kinton, light red, wh. star.
Beethoven, or., wh. veins.	Meteor, wh., striped crim.
Conqueror, crim., sc.	Olympia, crim. sc., tinged or.
Duke of Albany, bright sc.	Pauline, sc., feathered wh.
Eclipse, wh., striped sc.	Star of India, car., wh. bands.
Elphingham, sc. with wh. eye.	Syndic, light or., tipped wh.
Fabia, wh., sc. veins.	
Her Majesty, wh., flushed sc.	

Species :—

Belladonna (see Belladonna Lily). formosissima (see Sprekelia).



AMARYLLIS AVERUNICUS.

AMASONIA.

Dwarf tropical plants (*ord.* Verbenaceæ) of easy growth if accommodated in a warm intermediate house, and grown in rich sandy loam and leaf soil. Large pots are a mistake. Increased by division and from suckers. Calycina is now fairly popular.

Species :—

calycina, 1½', Sep., red, yel. (*syn.* punicea).
erecta, 1½', Jy., wh., pk.

AMATEUR.

The term "amateur" is very loosely used. Strictly speaking, it applies to anyone who follows a pursuit for the love of it, but for practical purposes at horticultural exhibitions it ought certainly to be restricted to that large and increasing class which cultivates crops as a pastime and not as a profession, and without paid professional help.

AMBLOSTOMA.

A small genus of Orchids (*ord.* Orchidaceæ) requiring similar treatment to the warmth-loving Epidendrums. One species in cultivation.

Amatungula (see *Carissa*).

Amber, Sweet (see *Hypericum Androsæmum*).

Amber Tree (see *Anthospermum*)

Species :—

cernuum, 1', Je., grn., wh. (*syn.* tridactylum).

AMBLYOLEPIS.

Texan plants (*ord.* Compositæ), included under *Helenium* by botanists. *Setigera* is a hardy annual, of erect, branched habit, with flower heads 1½" across. Remarkable for the persistent fragrance of the dried flowers and seeds.

Species :—

setigera, 1½', Jy., yel. (*syn.* *Helenium setigerum*).

AMBROSINIA.

Half-hardy perennials (*ord.* Aroidæ) with tuberous rootstock. The spathe is contracted longitudinally, compelling insects to effect fertilisation if they enter. In light soil only protection from frost is needed.

Species :—

Bassii, 4", My., grn., pur.

AMBURY or ANBURY (see *CABBAGE, CLUBBING*).

AMELANCHIER.

Ornamental shrubs or trees (*ord.* Rosaceæ) with toothed leaves and pretty racemes of white flowers and variously coloured fruits. Useful for shrubberies and pleasure grounds. Propagated by layers, seed, cuttings, and grafting on Hawthorn or Quince. Rich loam gives the best results. As most of the species flower early, they ought to have a sheltered situation to prevent the flowers from being destroyed by late frosts.

Principal Species :—

alnifolia, 8', Ap. A pretty species for dry soil (*syns.* canadensis var. alnifolia, canadensis var. florida, etc.).

canadensis, 6' to 20', Ap., fruit pur. Very ornamental when in bloom in spr., and prettily coloured in aut. (*syns.* asiatica, Botryapium, ovalis, etc.).

vulgaris, 9', Ap. A valuable shr. for spr. bloom (*syns.* Mespilus Amelanchier, Amelanchier rotundifolia, etc.).

Other Species :—

Botryapium (see canadensis), oligocarpa, 9', My., wet soil.

AMELLUS.

A small group of almost hardy perennials (*ord.* Compositæ) closely allied to the Michaelmas Daisies. Cool greenhouse; loam and leaf soil; cuttings, division, or seeds.

Species :—

Lychnitis, 1½', Aug., vio., villosus, 1½', Aug., yel. bl.

AMERICAN ALOE (see *AGAVE AMERICANA*).

AMERICAN BLIGHT or WOOLLY APHIS. (*SCHIZONEURA LANIGERA*.)

This insect is one of the worst pests of Apple trees, and has been known in this country for over a century. Its presence on the trees is easily detected by the cottony matter which gives shelter to numbers of the pests. Winged, viviparous females fly from tree to tree during summer and establish new colonies. Eggs are laid upon the

American Almond (see *Brabejum*).

trees in autumn by egg-laying females. When crushed the insects emit a reddish fluid. If left undisturbed under their natural protection they pierce the soft part of the bark and suck the juice. Ulcerations are formed, the adjacent bark splits open, canker sets in, and if the tree does not succumb it becomes so weakened as to be of little value. No part of the tree is safe from infestation, for even the roots are liable to attack, and occasionally the pest is introduced on the roots of young trees. The eggs, which are very small, are concealed in the crevices of the bark, so that American blight is easily introduced into a garden by planting infested trees. No efforts should be spared in eradicating the pest when it appears. Winter is the best time for the operation, using a mixture formed of $\frac{1}{2}$ lb. caustic soda (Greenbank's 98 per cent.), and $\frac{1}{2}$ lb. pearl ash (commercial potash) dissolved in 5 gals. of water. Spray the trees with the wash, applying sufficient to wet the branches. Gloves should be worn during the operation. The following insecticide is suitable for destroying the pest in the summer if sprayed on the branches or applied to the affected parts with a brush. (a) Boil 1 lb. of soft soap in 1 qt. of soft water for an hour. (b) Take it off the fire while boiling and pour in $\frac{1}{2}$ pt. of paraffin. (c) Pour the solution into a tub containing 8 gals. of water, and thoroughly churn with a syringe. It is best applied in the evening, when the sun is declining, otherwise the foliage may be badly injured.

AMERICAN COWSLIP (see DODE-CATHEON).

AMERICAN CRESS.

This plant (*Barbarea præcox*) resembles Watercress, but may be grown in any ordinary garden soil. Rich ground is rather detrimental than advantageous. Seed may be sown successively in spring, and in August for the plants to stand the winter with a little protection. The plants will need thinning, and should have water occasionally in summer unless a cool spot can be found for them. Use the outside leaves.

AMERICAN PLANTS.

Under this comprehensive term horticulturists bring together a number of hardy plants from diverse genera for cultivation in well-drained peaty soil. Almost all these make an abundance of fibrous surface roots, consequently, although sourness of the soil must be guarded against, it is necessary that such plants never lack moisture in the rooting medium. Leaf mould and well-decayed vegetable refuse make splendid material for top-dressing American plants. The principal genera included are *Andromeda*, *Azalea*, *Clethra*, *Erica*, *Gaultheria*, *Kalmia*, *Ledum*, *Pernettya*, *Pieris*, *Rhododendron*, and *Zenobia*. Quite a number of American plants enjoy shade from the hot midsummer sunshine.

AMETHYSTEA.

A hardy annual (*ord. Labiatae*) of erect habit, with small blue flowers, leaves three to five parted. Propagated by seeds sown in the open in March or April, or in heat at the beginning of March. Any good garden loam suits.

Species :—

cærulea, 1', Jy., bl. This is the only species of the genus (*syns. corymbosa* and *trifida*).

American Cranberry (see *Oxycoccus*).

AMHERSTIA.

One of the most gorgeous flowered of tropical trees (*ord. Leguminosæ*), surpassing, in India and Burmah, the graceful beauty which in temperate climes is associated with the Laburnum. There is but one species, a tree, bearing large leaves and long racemes of brilliant flowers. In this country it can only be grown in a large stove. The blooms only last two or three days.

Only Species :—

nobilis, 40', sum., rich ver.

AMICIA.

A small group of Mexican plants (*ord. Leguminosæ*) that can only be regarded as half-hardy in this country. Only one species is worth recording; it is a shrubby climber, and should be planted against a wall having a south aspect.

Principal Species :—

Zygomeres, 8', Jy., Aug., yel.

AMMOBIUM.

Pretty and well-known "everlasting" flowers (*ord. Compositæ*) differing from the *Gnaphaliums* by their habit alone. Flower heads about 1" across. Half-hardy annuals. Propagated by seeds sown under glass in March or April, and outdoors in May. Seeds may also be sown in August or September, and the plants kept under glass until spring. Light, rich, and sandy soil is best. The young plants ought to be thinned out or transplanted when fit to handle. If the flowers are wanted for preservation, cut before fully open in dry weather, and hang in bunches with the heads down to dry.

Principal Species :—

alatum, 2', sum., wh. The variety *grandiflorum* is superior to the type; it has larger and whiter blooms.

plantagineum, 1', Aug., wh.

AMMODENDRON.

Hardy evergreen shrubs (*ord. Leguminosæ*) allied to *Cladrastis*, *Virgilia*, and *Sophora*. Flowers violet or purple. Propagated by seeds in a frame, also by grafting on pieces of roots of established plants. They thrive in sandy or well-drained soil of a poor character in the garden or shrubbery.

Principal Species :—

Sieversii, 4', Je., hdy., pur. (*syn. bifolia*).

AMOMUM.

Herbaceous perennial plants (*ord. Scitamineæ*), dying down to the rhizomes in winter. The flowers vary in different species from white to pink, rose, red, yellow, and orange. They require a moist stove heat for their well-being. Most of them are valued for their ornamental foliage, which is deliciously fragrant when rubbed, as in the case of *Cardamomum*, *aromaticum*, etc. They are allied to *Hedychium* and the Ginger Plant. Propagated by division of the rhizomes or rootstock in spring, also by seeds. Two parts of fibrous loam, one part leaf mould, and half a part of well-decayed cow manure broken fine, with sufficient sand to make it porous, suit them.

Amianthemum (see *Zygadenus*).

Ammonogeton (see *Troximon*).

Amomysine (see *Leptophyllum*).

Principal Species :—

aromaticum, 3', Je., pur.,
yel.
Cardamomum, 4', Je.,
br., red.
Granum Paradisi, 3',
Mch., red. (Malaguetta)

Pepper, or Grains of
Paradise, chiefly ob-
tained from this species.)
Melegueta minor, My., st.,
pk.

Other Species :—

aculeatum, 10', My., or.
Afzelii, 3', My., pk.
angustifolium, 8', Je., red.
Clusii, yel.
— purpureum, 2½', red.
dealbatum, 3', Ap., wh.
grandiflorum, 3', Jy., wh.
latifolium, 4', Je., pur.,
yel.

magnificum, 10', Jy., red.
maximum, 5', Je., wh.
sceptrum, 5', Jan., ro.,
pur.
sericeum, 6', Jy., wh.
subulatum, 3', Ap., yel.
sylvestre, 1', Ap., wh.
vitellinum, 2', My., yel.

AMOORA.

Evergreen trees and shrubs (*ord.* Meliaceæ), some of them very tall, but others of moderate dimensions, with small flowers in the axils of the leaves, which are ornamental. Propagated by cuttings in sand under a handlight or propagating case. Fibrous loam two parts, leaf mould one part, sand one-fifth part.

Principal Species :—

cucullata, My., st., yel.

Rohituka, st., yel.

AMORPHA.

Small deciduous shrubs and sub-shrubs (*ord.* Leguminosæ), with long racemes of violet or blue violet flowers, which are Pea shaped. They are hardy in the south and other favoured parts of the country. Propagated by seeds, layers, or cuttings, the latter being taken in autumn, put in pots, and placed in a pit or frame where frost is excluded. Any good garden soil, well drained, will suit them.

Principal Species and Varieties :—

canescens, 3', Jy. to Sep.,
bl.
— Lewisii, 3', Jy., pur.
fruticosa, 6', Jy. to Sep.,
pur. Makes fine clumps.
— angustifolia, 9', Je.,
pur.

— carulea, 9', Je., pur.
— emarginata, 6', Jy.,
pur.
— microphylla, 2', Je.,
pur.

Other Varieties of fruticosa :—

croceolana, 5', Jy., pur.
glabra, 3', Jy., pur.

herbacea, 3', Jy., bl.
nana (*see* microphylla).

AMORPHOPHALLUS.

Description.—Herbaceous stove perennials (*ord.* Aroideæ) with a tuberous rootstock, flattened on the top, and sometimes of considerable size and weight. The flowers are the first signs of returning activity when growth recommences in spring. The usually solitary leaf follows the flowers, most of which are extremely fœtid. It is usually much divided, and occasionally of gigantic proportions. The spathe varies from green to white, brown, and purple. Most of them require a moist stove temperature.

Propagation.—By offsets, by division of the tuber when growth recommences in spring; also by seeds. The tubers are also frequently imported.

Soil.—Good fibrous loam two parts, leaf mould one part, and a dash of sand. Some growers use peat instead of leaf mould, but the latter is richer in plant food.

Principal Species :—

campanulatus, a lurid pur. spathe and very fœtid flowers. Allow its roots to dip into a tank when growing.

Amophyllum (*see* *Spathiphyllum*).

Rivieri, 3' to 4' high, nearly hdy., and may be grown in the open border in summer. The spathe in spring is lurid pur. (*syn.* *Proteinophallus Rivieri*).

Titanum has a blk. pur. spathe and spadix, the former 3' across, and the latter 5' high. The leaf-stalk attains 10', and its blade will then overshadow an area of 45 sq. ft. Flowers in spring, very fœtid. Its roots should be allowed to dip into a tank when growing (*syn.* *Conophallus Titanum*).

Other Species :—

dubius, 2', Je., pur.
Eichleri, 1½', spring, pur.,
wh.
Elliotii, 1', spring, pk.,
pur.
glabra (Pineapplescented).
grandis, 3', spring, grn.,
wh.
Lacourii, st., spotted wh.,
grn. (now *Pseudo-dra-*
contium Lacourii).
leonensis, pur. br.

nivosus (*see* *Dracontium*
asperum).
nobilis, lurid pur.
oncophyllus, 3', br., pur.
papillosus, grn., br.
pictus.
speciosus.
virens, grn., pur.
Wallisii (*see* *Dracontium*
asperum).
zebrinus.

AMPELOPSIS. (VIRGINIAN CREEPER.)

Description.—Rapid growing and beautiful hardy climbers (*ord.* *Ampelidæ*), now included by botanists under *Vitis*, but generally known in gardens as *Ampelopsis*, which name is now used for convenience. Valuable for covering walls, trellises, arches, etc.

Propagation.—Seeds, layers, cuttings, and eyes. Cuttings of young wood strike under heat in spring, and older wood taken off with an eye in September will strike either in a greenhouse or under glass outside.

Soil.—Common garden soil suits.

Other Cultural Points :—

The self-clinging species sometimes need to be fixed to the wall at first so as to give them a hold, when they will afterwards require no support.

Principal Species :—

aconitifolia (*see* *serianæfolia*).
quinquefolia, now *Vitis quinquefolia*. The common Virginian Creeper of gardens. Very ornamental, particularly in autumn (*syn.* *hederacea*).

serianæfolia, now *Vitis serianæfolia*. A distinct species with tuberous roots and fine foliage (*syns.* *lucida*, *triloba*, *tripartita*, *tuberosa*, etc.).

Veitchii, now *Vitis inconstans*. The greatest favourite, because of its self-supporting properties on a wall. So well known as to need no description (*syns.* *tricuspidata*, *Vitis Roylei*, etc.)

Other Species :—

bipinnata, 10', now *Vitis*
arbores.
hederacea (*see* *quinque-*
folia).
Hoggii. This is a form of
Rhus Toxicodendron.
muralis, a self-clinging
creeper, not yet referred
to its proper name.
sempervirens (*see* *Vitis*
striata).
tricuspidata (*see* *Veitchii*).

AMPELOVITIS.

Deciduous climbers (*ord.* *Ampelidæ*), allied to and having the habit of a Vine, not yet properly tried in this country, and should have the benefit of a wall in sheltered places till specimens have been fully tested. Fruit black. Propagation is by cuttings under a handlight in summer, and in sandy soil in a heated pit or frame in autumn.

Ampelgonum (*see* *Polygonum*).

Friable, and rather light, well drained loam is suitable.

Species :—

Davidi, fruit blk.
intermedia.

Romanetii (now Vitis
Romanetii).

AMPHICARPÆA.

Hardy, ornamental, twining perennials (*ord.* Leguminosæ), with the habit of the Scarlet Runner. Propagated by seeds; also by root tubers like the Scarlet Runner. Light, friable soil in the open border will suit them.

Species :—

monoica, 4', Sep., bl.

sarmentosa, 2', Sep., bl.

suitable for training on the roof. Flowers violet red or yellowish at first, produced in panicles terminating the shoots, and showy. Propagated by cuttings taken off with a heel of the old wood in spring and placed in a propagating case. Soil, fibrous loam and peat in about equal proportions, with a good dash of sand.

Species :—

paniculatum, 20' (*syn.* Bignonia paniculata).

AMPHITHALEA.

Small, silky woolly shrubs (*ord.* Leguminosæ) with small, entire leaves, and of Heath-like habit. Flowers small, purple or rose, in leafy spikes in the axils of the leaves. Requiring greenhouse



A DOORWAY WITH AMPELOPSIS VEITCHII (VEITCH'S VIRGINIAN CREEPER) AND JASMINE.

(From a photograph supplied by Mrs. F. A. Bardswell.)

AMPHICOME.

Perennial herbs (*ord.* Bignoniaceæ), closely allied to and having a similar habit to Incarvillea; half-hardy, and succeeding best with a cool greenhouse temperature, like that given to Cape Heaths. Flowers lilac, rose, or purple with a yellow or orange throat, and trumpet shaped. Propagated by seeds in spring, and cuttings of half-ripened shoots in sandy soil in a warm pit or propagating case.

Principal Species :—

arguta, 1', Aug., red.

Emodi, 1½', Aug. to Oct.,
ro., or.

AMPHILOPHIUM.

Tall evergreen stove climbers (*ord.* Bignoniaceæ),

Ampherephis (see *Centratherum*).

Amphiscopia (see *Dianthera* and *Justitia*).

treatment. Propagated by seeds; also by cuttings in spring under a hand-glass. Loam, peat, and sand make a suitable soil.

Only Species introduced :—

ericæfolia, 2', Jan., pk.

AMSONIA.

Hardy herbaceous perennials (*ord.* Apocynaceæ), some of them slightly woody. Flowers nearly always blue and showy. Propagated by seeds in a frame in spring; also by cuttings under a hand-light in summer, using very sandy soil; and by division in spring. Any good, well drained soil, and light rather than heavy. The rockery would suit them.

Principal Species :—

angustifolia, 2', sum., bl.

salicifolia, 2', sum., bl.

Tabernaemontana, 2',

sum., bl. (*syn.* latifolia and Tabernaemontana Amsonia).

AMYGDALUS.

The Amygdaluses, or Almonds, are amongst the earliest of shrubs to bloom, and are valuable on that account. *A. communis* is the Common, *A. c. amara*, the Bitter, and *A. c. dulcis* the Sweet, Almond (*see* *Prunus*).

AMYRIS.

Moderately tall, evergreen stony trees and shrubs (*ord.* *Burseraceæ*), charged with a resinous and very fragrant gum. Flowers, small and white, in clusters of three, followed by small, aromatic, oily drupes or berries. Propagated by cuttings in sandy peat or sand, in a propagating case in spring, and not overcharged with atmospheric moisture. Fibrous loam and peat in equal proportions, with plenty of sharp sand to keep the mixture porous, suit.

Principal Species:—

Plumieri, 20', wh. This species is one of those which produce the resin called Gum Elemi (*syn.* *elemifera*).

toxifera, 10', wh. This is poisonous, and furnishes the wood called Lignum Rhodium (*syn.* *balsamifera*).

Other Species:—

balsamifera (*see* *toxifera*). *heptaphylla*, 16', wh. *brasiliensis*, 20', Aug., wh.

ANABASIS.

About fifteen species of perennial herbs (*ord.* *Chenopodiaceæ*), or some of them slightly woody, making sub-shrubs, useful for planting on dry banks or the drier portions of the shrubbery borders. Increased by cuttings in pots of sandy soil under a handlight in summer. Any ordinary garden soil, if well drained, will suit, but that of a dry and sandy nature is preferable.

Principal Species:—

Ammodendron, a hdy., erect, yel. shr. now referred to *Haloxylon*.

ANACAMPSEROS.

Low, succulent or shrubby plants (*ord.* *Portulacaceæ*), with the habit of *Portulacaria*, and like it requiring dry, greenhouse treatment, especially in winter, when no atmospheric moisture should be given. They are S. African plants, with pink, rose, or yellow flowers, of a showy character. Leaves fleshy, crowded. Propagated by seeds; also by cuttings and leaves in a slightly warm pit. They will be less liable to damp off if cut and allowed to dry for two or three days before putting them in pots of sandy soil or sand. Light sandy loam, mixed with some old mortar and pieces of soft red bricks broken to the size of marbles, suits. Add sand.

Principal Species:—

arachnoides, 1' to 1½', sum., pk.
filamentosa, 1', Sep., pk., starry flowers borne well above the crowded leaves.

Telephiastrum, 9'', pk., flowers close to the roundish leaves (*syns.* *rotundifolia* and *varians*).

Other Species:—

angustifolia, 1', Jy., pk. *rubens* a var. of *arachnoides*, 1', Jy., pk.
lanceolata, 1', Aug., pk. *varians* (*see* *Telephiastrum*).
pol. phylla, 1', Aug., pk.

ANACARDIUM.

Tropical American trees (*ord.* *Anacardiaceæ*), with oval, entire leaves, and red and yellow or rose coloured flowers produced in panicles, followed by a large Pear-shaped, false fruit surmounted by a nut, the kernel of which may be eaten after being

roasted. It is also dried and ground for flavouring wine. Moist stove treatment is necessary. Propagated by seeds. Cuttings of ripened shoots with leaves in pots of sand will also root under a bell-glass or in a propagating case. Loam and peat in about equal proportions, with plenty of sharp sand to render it porous, will grow them.

Principal Species:—

occidentale, 20', grn., red. — *indicum*, 20', grn., red.
Cashew Nut.

ANACYCLUS.

Annuals or perennials (*ord.* *Compositæ*), with white, yellow, or purple rays and yellow discs. Suitable for rockeries. Propagated by seeds or division of the roots in spring. Light and sandy soil, with full exposure to the sun, suits them.

Principal Species:—

clavatus, 9', Aug., wh., half-hdy. ann. (*syn.* *Anthemis incrassata*).

formosus, 9', Je., wh. A charming Alpine, rather tender, full sun (*syn.* *Leucocyclus formosus*).

radiatus purpurascens, 1', sum., wh. above, pur. beneath, hdy. ann. (*syn.* *Anthemis purpurascens*).

ANAGALLIS.

Description.—Annual, biennial, or perennial herbs (*ord.* *Primulaceæ*), of trailing habit, or in a few cases creeping and rooting. Flowers, small but very numerous. All the biennials and perennials require greenhouse treatment in winter, with the exception of the British Bog Pimpernel (*tenella*), which is perfectly hardy. They are known as Pimpurnels, particularly the hardy ones, and all are of the easiest culture; even the biennials and perennials may be grown in the open border or upon the rockery in summer.

Propagation.—The annuals by seeds in the open ground in April. Biennials by seeds in a greenhouse or frame. Perennials by cuttings in heat in spring, except *tenella*, which may be cut into any number of pieces with roots attached, sufficiently early in spring to get established before drought commences.

Soil.—Loam two parts, peat one part, with a good dash of sharp sand, will suit the biennials and perennials in pots. *Tenella* may be planted in the bog bed or garden in peaty soil, or grown in pans if so desired, giving it plenty of moisture.

Principal Species:—

arvensis, a popular hdy., trailing, red ann., the Pimpernel or Poor Man's Weather-glass. There are pk. and wh. varieties, the latter having a pk. eye. Je. to Sep.

cærulea is really a bright bl. variety of *arvensis*, also British.

latifolia, also a hdy. ann., with bright bl. flowers, like *cærulea*, but larger in every way, and more trailing; flowering in sum. (*syn.* *indica*).

linifolia, 1', Jy., grh., bl. Of this there are several varieties, such as *Breweri*, 9'', Je., grh.; *lilacina*, 1', My., grh.; *phœnicea*, 1', My., grh.; and *Philipsii*, 9'', Je., bl. (*syn.* *Monelli*).

Other Species:—

alternifolia, Ap., grh. *indica* (*see* *latifolia*).
per., yel., pk. *Marryattæ*, 1', Jy., half-hdy., copper.
collina, 3', Aug., grh. *Monelli* (*see* *linifolia*).
bien., verm. *webbiana*, 1', Jy., half-hdy., bl.
— *alba compacta*, grh. *willmoreana*, 6'', Aug., welliana, 1', Aug., grh.,
bien., wh. *grh. bien.*, pur. copper.
fruticosa (*see* *collina*).

Anadenia (*see* *Grevillea*).

ANAGYRIS.

Shrubs (*ord.* Leguminosæ) with the habit of some of the species of *Cytisus*, distantly related to them, and requiring similar treatment in a greenhouse. The fairly large and showy yellow flowers are followed by twisting pods. Propagated by cuttings of half-ripened shoots in sandy loam or peat, under a bell-glass or hand-light. Soil, fibrous loam two parts, peat one part, and a good dash of sharp silver sand.

Principal Species :—

foetida, 9', Ap., My. — *glauca*, 6', Ap. *latifolia*, 18', Ap.

ANANAS (*syn.* ANANASSA).

Herbaceous perennials (*ord.* Bromeliaceæ), with hard, stiff leaves arranged in tufts, and with spines on the margin. *Sativus* and *bracamorensis* are Pineapples, with edible fruits. They may be grown in pots in a moist stove atmosphere, or planted out in borders in specially constructed pits. (*See* Pineapple.) Propagated by seeds in a propagating pit. More often by suckers, which may or may not be rooted when taken off. The tuft of leaves on the top of the fruit may also be rooted. Soil, two parts of good fibrous loam and one part of leaf mould, with plenty of sharp sand. Some well-rooted cow manure should be added for the Pineapples.

Principal Species :—

sativus, 3', Ap., st., pur; the Pineapple; grown solely for its fruit, but the variety *variegatus* is a handsome st. foliage plant, the leaves being edged yel. and often with red as well.

— *bracamorensis*; the red and yel. fruits of this species are very handsome, and attain a weight of 6 lb. to 8 lb.

Other Species and Varieties :—

<i>bracteatus</i> , 3', Ap., crim.	<i>Mordilona</i> (<i>see</i> <i>sativus</i>
<i>macrodonates</i> , reddish (<i>syn.</i>	<i>lucidus</i>).
<i>Bromelia undulata</i>).	<i>sativus lucidus</i> , 3', Ap., pk.
<i>mensclorifanus</i> (<i>see</i> <i>Æch-</i>	— <i>porteanus</i> , grn., yel.
<i>mea</i> <i>Fernandæ</i>).	leaves.

ANAPHALIS.

Hardy perennial herbs (*ord.* Compositæ), similar in habit to *Gnaphalium* and *Antennaria*, and suitable for the herbaceous border. *Margaritacea* is extensively cut, dried, and dyed as everlasting or immortelles. Propagation is sometimes by seeds, but chiefly by division in spring. Any friable and ordinary garden soil will suit.

Principal Species :—

<i>margaritacea</i> , 1' to 2',	<i>triplinervis</i> , 1', Aug., wh.
Aug., wh. (<i>syn.</i> <i>Anten-</i>	(<i>syn.</i> <i>Antennaria tripli-</i>
<i>naria margaritacea</i>).	<i>nervis</i>).
<i>royleana</i> , 4' to 6', Sep.,	
wh., yel.	

ANARRHINUM.

Half-hardy annuals, biennials, and perennials (*ord.* Scrophularinæ), with long racemes of blue or white flowers. The annuals and biennials propagated by seeds in a heated frame or on a dung bed in spring. Perennials by cuttings in sandy soil under a hand-light in summer. Light sandy loam while the plants are in pots. Friable, well-drained soil in the open garden.

Principal Species :—

<i>bellidifolium</i> , 2', Jy., hdy.	<i>fruticosum</i> , 2', Aug., half-
bienn., bl.	hdy., wh.
<i>Duriminum</i> (<i>see</i> <i>hirsu-</i>	<i>hirsutum</i> , 1½', half-hdy.,
<i>tum</i>).	wh.

Anantherix (*see* *Gomphocarpus*).

ANASTATICA.

A dwarf annual (*ord.* Cruciferae), with small white flowers of no particular beauty. It is the Rose of Jericho or Resurrection plant, so called because it grows up during the rainy season in the sandy deserts of its native regions, flowers, ripens its seeds, and with the advent of the dry season dries up, its roots dying and its branches contracting into a rounded mass. In this state it gets blown about over the sands by the wind till it reaches water or sufficient moisture, when the branches spread out again as if alive. Propagation is by seeds in a frame in spring. It is of the easiest culture, in any friable or light garden soil.

Microchuntica, 1', Jy., half-hdy., wh., is the only species.

ANBURY (*see* CABBAGE, CLUBBING).**ANCHIETEA.**

Evergreen, woody climbers (*ord.* Violariæ), with white or pale coloured flowers, and requiring a stove temperature with plenty of atmospheric moisture when growing. Propagated by seeds in heat; also ¹⁴by cuttings under a bell-glass or in a propagating case. Soil, equal proportions of loam and peat, with a good dash of sharp sand.

Principal Species :—

pyrifolia, 3', Jy., wh. and red veins.

ANCHOMANES.

Deciduous stove perennials (*ord.* Aroideæ), having a tuberous rootstock, very similar in habit to *Arisæma*, *Sauromatum*, and *Amorphophallus*. The spathe is purple outside, and paler or white inside. Propagation is by seeds in heat; but more often by offsets or by division of the tuber with a bud to each piece. Soil, good fibrous loam broken up by hand, with nearly an equal amount of rich leaf mould, and plenty of sharp sand. Drain well. After the leaf dies down, withhold water and let the tubers rest for a time, then repot them, but give little or no water till they are growing freely, when they require an abundance at the root and in the atmosphere.

Principal Species :—

dubius, spring, pur., cream.
Hookeri, 3', Je., pur. (*syn.* *Caladium petiolatum*).
— *pallida*, 3', Je., pur.

ANCHUSA.

Bugloss or Alkanet. Showy, but often coarse, generally hardy, annuals, biennials, or perennials (*ord.* Boraginæ) with blue or purple flowers. Propagated by seeds sown in the open or under glass in spring; also by cuttings. Ordinary garden soil. The greater number prefer a sunny position.

Principal Species :—

Barrelieri, 2', Je., per., bl., tube wh. A pretty, rather tender plant (*syn.* *Buglossum Barrelieri*).
capensis, 1½', Jy., bl., bienn., needs grh. in winter.
italica, 4', Jy., bl. Perhaps the best per. in warm gardens. There are some superior forms, that called *amœna* being good (*syns.* *azurea* and *paniculata*).
sempervirens, 2', Je., per., bl. Showy, but rather coarse.

Anchovy Pear (*see* *Grias*).

Other Species :—

affinis, 1', Jy., tender per., bl.	myosotidiflora, 1', Aug., per., pk.
Agardhii, 1', Aug., per., bl.	ochroleuca, 2', Jy., per., yel.
hybrida, 1½', Je., ann., pur., wh.	officinalis, 2', Jy., bl., pur., flesh.

ANCYLOGYNE.

Small, evergreen stove shrubs or sub-shrubs (*ord.* Acanthaceæ). Of easy culture. Increased by cuttings under a bell-glass, or in a propagating case in sand or sandy soil. Soil, two parts of fibrous loam, one part good leaf soil, and plenty of sand to keep it open. Peat may be used instead of leaf soil. The genus is referred by some botanists to *Sanchezia*.

Principal Species :—

longiflora, Ap., pur.	— glaucophylla, 2', yel., red.
nobilis, 2', Je., yel., red.	

ANDERSONIA.

Small greenhouse shrubs (*ord.* Epacridæ) allied to *Epacris*. Propagated by seeds, also by growing tops in sandy peat under a hand-light in mild heat. Soil, fibrous peat broken up fine, with plenty of silver sand. Pot firmly.

Principal Species :—

cærulea, 2', pk., bl.	sprengelioides, 2', Mch., pk. (<i>syn.</i> Sprengelia Andersonii).
depressa, 6', grn., bl.	
homalostoma, 1', pk., bl.	

ANDIRA.

Evergreen stove trees (*ord.* Leguminosæ) requiring a warm conservatory or stove for their accommodation. Propagated by cuttings in sandy soil in a warm propagating case. Soil, fibrous loam and peat in equal portions, and some sharp sand.

Principal Species :—

inermis, 20' to 30', pur.	The Cabbage Tree.
racemosa, 30' to 60', pur.	

ANDROCYMBIUM.

Greenhouse perennials (*ord.* Liliacæ) with tufted leaves. The flowers nestle in the centre of the tufts of leaves. Propagated by offsets and by seeds. Soil, light, sandy, fibrous loam, well drained.

Principal Species :—

punctatum, 1', wh., probably the only one in general cultivation.	
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ANDROLEPIS.

Evergreen stove herbs (*ord.* Bromeliacæ) of tufted habit, now placed by Mr. J. G. Baker under *Æchmea*. Propagated by seeds, and offsets or suckers. Soil, fibrous loam peat, and broken pots-herds.

Principal Species :—

Skinneri, 1½', wh. (<i>now</i> Æchmea Skinneri).	
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ANDROMACHIA.

Herbaceous perennials (*ord.* Compositæ), succeeding best with greenhouse culture. Propagated by seeds, also by cuttings in sandy soil in gentle heat. Soil, light fibrous loam and leaf mould, with sufficient sand to keep it open (correctly referred to *Linum*).

Principal Species :—

Maronii, 2', grh., yel.	
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ANDROMEDA.

Very ornamental shrubs (*ord.* Ericacæ) with beautiful wax-like flowers. Propagated by layers pegged down in autumn, and by seeds sown in pots

when ripe, covered thinly and placed in a frame. A peat soil, not too dry, will grow the *Andromedas* well. They delight in partial shade and shelter from cold winds.

Principal Species :—

The greater number of the plants formerly under *Andromeda* have been included in other genera, such as *Cassandra*, *Cassiope*, *Leucothoë*, *Oxydendron*, *Lyonia*, *Zenobia*, *Pieris*, *Enkianthus*, and *Daboecia*.

flicribunda, perhaps the best known species, now referred to *Pieris floribunda*.

polifolia, 1', Je., pk. A very beautiful shrub whose foliage becomes finely coloured in autumn. The varieties differ in colour from the type.

ANDROPOGON.

A large genus of Grasses (*ord.* Graminæ) of the easiest culture in a warm house. Propagated by seeds, and also to any extent by division of the tufts or clumps. Fibrous loam, and a good dash of sand to keep it porous, will be sufficient for their requirements. If the soil is heavy use a third of peat.



Photo: W. H. Waite, Edinburgh.

ANDROSACE LANUGINOSA OCLATA.

Principal Species :—

Schoenanthus, 2', st. (*syn.* citratus). Lemon Grass, very sweetly scented when bruised.

Other Species :—

formosus, 1½', Mch.	pubescens.
fureatus, 1½', hy.	squarrosus.
muricatus.	striatus, 1½', Aug.

ANDROSACE. (ROCK JASMINE.)

Description.—Charming perennial or annual Alpine flowers (*ord.* Primulacæ) of dwarf habit, and universally recognised as among the choicest rock plants.

Propagation.—By division in spring, by cuttings under glass in summer, and by seeds sown when ripe or in the following spring.

Soil.—A rich, sandy peat, with a liberal mixture of grit, suits the majority of the species, but some need lime in the form of limestone or old mortar rubbish.

Other Cultural Points.—Jam the plants between stones, ensuring at the same time that the roots receive the rainfall, which must be kept off the leaves as much as possible. Ample drainage is necessary, and the greater number must be protected from rain in winter by a slate or a piece of glass fixed a few inches above the plants, or by a projecting stone of the rockery. Top-dress with peat and sand in spring and autumn. The Androsaces also make pretty plants for growing in pots in a frame or cold house. The pots must have good drainage, and similar soil to that indicated for plants grown in the open.

Principal Species :—

carnea, 3", Jy., pk. A lovely little plant with narrow leaves and charming flowers. The variety *eximia* is very beautiful. S.W. aspect with partial shade.

foliosa, 5", Je., flesh. A pretty plant with nice heads of flowers, and rather large, hairy leaves. South exposure; limestone.

lanuginosa, 9", sum., ro. A lovely trailing plant with silvery leaves and heads of beautiful flowers. Sunny position and hanging over stones. The variety *Leichtlini* has wh. flowers with a pk. eye. *sarmentosa*, 3", My., ro. A pretty plant which sends out runners after the style of a Strawberry. It ought to be covered in winter to protect it from rain. The variety named *Chumbyi* is more compact in its habit.

sempervivoides, 3", My., pur. A very distinct Androsace with rosettes like *Sempervivum*, and propagating itself by runners.

villosa, 4", My., ro. A nice little plant with downy leaves. The variety *Chamæjasme* is very beautiful.

Other Species :—

alpina, 3", Je., ro.
bryoides, 1", My., wh.
coronopifolia (*see* *lactiflora*).
elongata, 9", Ap., wh.
filiformis, 9", My., wh.
imbricata, 2", Je., wh.
lactiflora, 6", My., umn.,
wh. (*syn.* *coronopifolia*).
Lagleri, 3", Mch., pk.

obtusifolia, 4", Ap., ro.
(*syn.* *arctioides*).
pyrenaica, 1", sum., wh.
septentrionalis, 9", Jy.,
wh.
vitaliana, 2", Je., vel.
(correctly, *Douglasia*
vitaliana).
wulfeniana, 3", Je., ro.
— *Pacheri*.

ANDROSTEPHIUM.

Bulbous plants (*ord.* *Liliacæ*) with blue flowers, and requiring the protection of a frame in winter. Flowers in umbels, and pretty. Propagated by seeds in boxes of sandy soil and leaf mould in spring. Offsets may be taken off and potted separately. Soil, good, fibrous, mellow loam, with a third of leaf soil, and plenty of sand to make it light and porous.

Principal Species :—

violaceum, 6", spr., half-hdy., bl.

ANDRYALA.

Annual, biennial, or perennial herbs (*ord.* *Compositæ*), either hardy or requiring greenhouse treatment. They are rather pretty plants allied to the Hawkweeds, with yellow flower heads, and of easy culture. The annuals and biennials are propagated by seeds in a frame, and the former afterwards planted out. Perennials by division. In the open air any friable garden soil will be suitable. For pot culture use loam and leaf soil with a good dash of sand.

Androsænum (*see* *Hypericum*).

Principal Species :—

lanata, 9", My. and Je., hdy. per., yel. Requires no protection.

Other Species :—

integrifolia, 1', Aug., hdy. *mogadorensis*, 2', Ap.,
bien., yel. grh. per., yel.

ANEILEMA.

Perennial herbs (*ord.* *Commelinacæ*), mostly of trailing habit like the *Tradescantias*, some requiring stove and others greenhouse temperature, the former with atmospheric moisture. Propagated by seeds in heat, also by cuttings, and division of those plants which lend themselves to this method. Soil, sandy loam two parts, leaf mould one part, and sufficient sand to make it porous.

Principal Species :—

giganteum, 1', Jy., st., bl. *sinicum*, 1', My., grh.,
pur. bl.

Other Species :—

acuminatum, 1', Aug., *nudicaule*, 1', Jy., st., bl.
st., bl. *nudiflorum*, 1', Jy., grh.,
ambiguum, 3", Jy., st., bl.
bl. *spiratum*, 1', Jy., grh.,
biflorum, 1', Aug., grh., bl.

ANEMIA (*syn.* *ANEMIA*).

Handsomestove or greenhouse Ferns (*ord.* *Filices*). The spore-bearing branch of the frond is often



A "FLOWERING FERN"—ANEMIA PHYLITIDIS.

panicked or much divided with narrow segments, very different from the leafy portion of the frond, hence gardeners speak of them as flowering Ferns, as in the case of the *Osmundas*. *Adiantifolia* is one of the most graceful and ornamental species, having the leafy branch of the frond triangular and thrice divided. Give plenty of water at the roots when growing. Propagation is by spores, also by division when the plants have formed two or more crowns.

Soil, fibrous loam two parts broken up by hand, fibrous peat one part, and a third of sand.

Principal Species :—

- | | |
|-------------------------------|----------------------------------------------------|
| adiantifolia, 3', Aug., st. | — lanceolata, 2', Aug., grh. |
| Phyllitidis, 1', Je., grh. | — lineata, lined with yel. |
| (syn. Anemidictyon | — longifolia, 1', Aug., grh. |
| Phyllitidis). | — tessellata, 1', Aug., grh. (syn. A. P. plumbea). |
| — fœtida. | |
| — fraxinifolia, 1', Je., grh. | |
| — laciniata, 1', Aug., grh. | |

seeds, sown as soon as ripe, or in spring. The awned Anemones, with the exception of coronaria, are often long in germinating. The tubers of the tuberous-rooted species can be divided when large enough, while the others can usually be propagated by division when of sufficient size. The species with roots like those of *Anemone japonica* may be propagated by root cuttings put in pots or boxes in spring, and placed in gentle heat.

Soil.—A good garden soil will answer for the greater number. The Wood Anemones, *nemorosa*,



BLUE WOOD ANEMONES.

Phyllitidis and most of its varieties, but particularly *fraxinifolia*, are valuable because they can be grown in a grh. temperature.

Other Species :—

- | | |
|------------------------------|----------------------------------|
| coccinea, 1', Aug., st. | — tenella, 1', My., st. |
| collina, 1', Aug., st. (syn. | humilis, 1', Jy., st. |
| hirta). | repens (see <i>hirsuta</i>). |
| dregeana, 9'', grh. | tomentosa, 1' to 2', st. |
| hirsuta, 3', Je., st. | villosa (see <i>tomentosa</i>). |

ANEMONE. (WIND FLOWER.)

Description.—Highly ornamental garden plants (*ord.* Ranunculaceæ). Almost all the species are greatly valued for the beauty of their flowers, and for the usefulness of their blooms for cutting. The genus includes plants suitable for almost any position, and of much variety of form, colour, and stature. Some of the Anemones are among the earliest of our garden flowers, while others give blooms until they are cut off by frost.

Propagation.—Nearly all can be propagated by

Anemidictyon (see *Anemia*).

n. robinsoniana, etc., like a rich sandy soil; *blanda* ought to have a heavier one, approaching to clay; and *japonica* flourishes on one of a heavy nature also.

Principal Species :—

alpina, 1', My., wh. A very handsome plant for a moist border or the base of the rockery in full sun. The leaves are beautifully divided.

angulosa, 9'', Feb., Mch., bl. Better known as *Hepatica angulosa*. It prefers shade, and a soil which is not too dry. There are scarce wh. and pk. varieties. A form which is rather inclined to make suckers does not flower as freely as the one which increases slowly at the root.

apennina, 6'', Mch. and later, bl., ro., or wh. A very pretty Windflower, which does well in peat and under trees. A capital thing to naturalise in a wood or dell.

blanda, 6'', winter and early spring, bl. or wh. A charming early plant. It comes very early, and should have a sunny sheltered place. There are several varieties, that named *scythica* being among the best. Heavy soil.

coronaria, 1', Ap., etc., various. The favourite Poppy Anemone, one of our best garden flowers. A popular florist's flower a number of years ago. Easily raised from seeds, which should be mixed with dry sand to separate them. There are both single and double forms. The finest strain is the St. Brigid. A good wh. is The Bride.

fulgens, 1', My., c. An invaluable plant, classed by botanists with hortensis, but known to gardeners as distinct. One of the most brilliant spring flowers. It is difficult to bloom in some gardens, without apparent cause. Give a full exposure to the sun, so as to ripen the tubers in the soil, though it should be moist early in spr. There are several forms, the double and the single variety græca both being good. Seeds or division.

Hepatica, 6'', Feb., Mch., bl. The common Hepatica, for so many years a garden favourite. There are a number of vars., among them being alba, wh.; rubra, red; splendens, fine red; Barlowii, pur. bl.; rosea, pale pk.; variabilis, marbled foliage; double red; double bl.; and a very rare double wh., besides others. Acutiloba only differs in the form of the leaves. Hepaticas like a rich soil with plenty of shade in sun. Disturb them as little as possible. (*syns.* Hepatica triloba and H. americana.)

hortensis, 1', Ap., red, bl., etc. Recognised as a species, including fulgens, stellata, and their forms, with pavonina. Probably related to coronaria, but of less value in cold districts. There are many single and double forms. A pretty form of the type, named stellata fl. pl., has sharp-pointed double flowers, and is distinct from fulgens fl. pl. Division of tubers, or seeds sown in spr.

japonica, 2', aut., red. One of the best of our aut. hdy. flowers, and grown in almost every garden. The wh. form, j. alba, or Honorine Joubert, is a charming flower, and the ro. coloured j. hybrida is also finer than the type. A number of new forms have been raised from seed; of these may be named Lord Ardilaun, Lady Ardilaun, Whirlwind, Mont Rose, Coupe d'Argent, Beauté Parfaite, Colletterie, and Vase d'Argent. A good strong soil, with sufficient moisture, suits this Anemone. Propagated by division, root cuttings, and seeds.

narcissiflora, 1', My., wh. A pretty Anemone with umbels of milk wh. flowers. Grows well in borders of light soil, or in the rock garden. Partial shade. Seeds or division.

nemorosa, 6'', Mch., wh. Our native Wood Anemone, very variable in colour, and the parent of a number of forms. The best with bl. flowers are robinsoniana and the newer Allenii. Other good coloured vars. are rosea, purpurea, and cærulea. The best single wh. is grandiflora. Bracteata, with a frill of grn. round the blooms, is very attractive; and the double form of nemorosa should be grown everywhere. All like a peaty soil and shade.

Pulsatilla, 1', Ap., bl. The Pasque Flower, a beautiful British plant which thrives best on a dry chalk soil. Propagated by seeds. The new form alba has pretty wh. blooms.

sylvestris, 1', Ap., wh. A very beautiful species which prefers a shady position in light soil. The double var. is a charming plant.

Other Species :—

albana, 1', My., wh.
baicalensis, 1', Je., wh.
baldensis, 6'', My., wh.
castra, 1½', grh., wh.
cernua, 8'', My., pur.

decapetala, 1½', Je., wh.
deltoidea, My., wh.
Fanninii, 5', Je., grh., wh.
Halleri, 9'', Ap., pur. [red.
multifida, 9'', Je., yel. or

obtusiloba, 6'', Je., wh.
palmata, 9'', My., yel. or wh.

patens, 1', Je., pur.
pennsylvanica, 1½', My., wh.

polyanthes, 1', My., wh.
pratensis, 10'', My., pur.
ranunculoides, 4'', Mch., yel.

Richardsonii, 6'', Je., yel.
rivularis, 1' to 4', My., wh.

sibirica, 3'', Je., wh.

sulphurea, 1', My., sulp.

trifolia, 6'', Ap., wh.

vernalis, 1', My., wh., bl.

virginiana, 2', My., pur.

vitifolia, 2', Aug., tender, wh.

ANEMONOPSIS.

The only member of the genus (*ord.* Ranunculaceæ) is a fine herbaceous plant named macrophylla, which bears a resemblance to Anemone japonica. It grows 3' high, blooms in July, and has white flowers with twelve petals, tinged outside with purple. It likes a sandy soil, not too dry, with some shade from strong sun. Propagated by seeds and division in spring.

ANEMOPÆGMA.

Stove climbers (*ord.* Bignoniaceæ) with the habit of Bignonia, and therefore suitable for training up the pillars and rafters in tall houses. Flowers in clusters, or racemes, white, yellow, or purplish. Propagation is by imported seeds in heat. Also by cuttings of short shoots getting firm at the base, taken off with a heel of the old wood and plunged in pots in a hotbed, or placed in a propagating case. Fibrous, turfy loam broken up roughly, and a third of peat with plenty of sharp sand, suit.

Principal Species :—

racemosum, 10' to 30', buff pur.
clematideum (*see* Pithecoctenium).

ANETHUM.

Graveolens (now Peucedanum graveolens), 3', yellow (*ord.* Umbelliferae), is the common Dill, the leaves being used for soups, and the umbels and leaves for pickling. Biennial. Sow seed when ripe, or in spring. Dry soil.

ANGELICA.

Tall, coarse growing, hardy herbs (*ord.* Umbelliferae), of no particular value. The leaf stalks at one time were blanched and eaten like Celery, or candied and used as a confection. Propagation by seeds; also by division of the stools. Of the easiest culture in any garden soil.

Principal Species :—

officinalis, 4' to 6', Jy., songorica, 4', Jy. to Sep., grn. (*syn.* Archangelica). wh.

ANGELONIA.

Herbaceous perennial herbs (*ord.* Scrophularinæ) allied to Alonsoa and Nemesia, and some of them really very pretty. Some require a dry stove, others do well in a greenhouse, or in a frame in summer. Propagated by seeds in a warm pit in February and March to flower the same year. Also by cuttings of shoots when 3' long, in sandy soil under a bell-glass or hand-light, and not kept too damp. Fibrous mellow loam two parts, leaf mould one part, and plenty of sharp sand, will suit. Some species may be divided.

Principal Species :—

angustifolia, 1', Je., Jy., grandiflora, 1', Jy. to
grh., dark vio. Sep., grh., pur.
cornigera, 1', Aug., st., miniata, 1', My., grh.,
pur. wh.
floribunda, 1', Aug., st., salicariaefolia, 2', Aug.,
pur. st., bl.
Gardneri, 1', My., grh.,
pur., wh.

Angelica Tree (*see* Aralia spinosa).

ANGIANTHUS.

Annual or perennial herbs (*ord.* Compositæ), smooth or woolly. One species is shrubby. They require greenhouse treatment. Propagation by seeds; and the perennials by cuttings in spring under a hand-light in gentle heat, and kept rather dry overhead. Sandy loam and leaf mould suit.

Principal Species :—

aureus (*see* *Cassinia aurea*). *Chrysocoryne angian-*
pusillus, 6" to 1', Jy., *thoides*.
grh., straw colour (*syn.*)

ANGIOPTERIS.

Strong growing, bulky Ferns (*ord.* Filices), that require plenty of room for their perfect development. They throw up large fronds as thick as giant Rhubarb stalks in the case of *evecta*, which is variable, and by some authors split up into ten to sixty species. Moist stove temperature, with abundance of water at the root all the year. Propagation is by spores. An easier process is to import plants. Fibrous loam two parts, peat one part, and plenty of sand, suit. The pots or tubs must be well drained by reason of the copious watering necessary.

Principal Species :—

evecta, 6' to 15', Je., st. — *miqueliana*.
— *brongniartiana*. — *pruinosa*.
— *macrophylla*. — *teysmanniana*.

ANGOPHORA.

Strong growing, evergreen shrubs (*ord.* Myrtaceæ), thriving satisfactorily with greenhouse treatment. They are most suitable for tall conservatories. Propagation is by seeds in heat; also by cuttings of mature shoots, in very sandy soil and peat, under a hand-light in gentle heat. Equal proportions of fibrous, mellow loam and peat, with clean silver sand to allow the free passage of water, will suit.

Principal Species :—

cordifolia, 6' to 10', My. to Aug., yel. (*syns.* *Eucalyptus* *hirsuta*, *Metrosideros anomala*, *M. hirsuta*, *M. hispida*).
costata, 6', Jy., Aug., yel.
lanceolata, 10', Je. to Nov., crim.

ANGRÆCUM.

Description.—A large genus of epiphytal Orchids (*ord.* Orchidaceæ) chiefly from the tropics of the Old World, and therefore requiring hot and moist treatment in the East Indian house. Flowers mostly white, but some are tinted with green, buff, pink, lemon, cinnamon, or cream. All are characterised by having a spur to the lip, frequently of great length. Many are sweetly scented.

Propagation.—By offsets, which may be severed from the parent plant, with or without roots, in spring; or any other time when growth is just becoming active.

Soil.—Being epiphytes or air plants no soil is necessary; but a large quantity of drainage, in the form of clean crocks, should be used for plants grown in pots or baskets. Clean, live sphagnum moss should be placed over the drainage and about the roots of the plants, which should be staked to keep them steady till the roots take fresh hold.

Other Cultural Points.—*Eburneum* and *sesquipedale* are usually grown in pots. The smaller species may be grown in teak wood baskets of a size to suit the various species. Many of the small ones succeed best on teak rafts covered with sphagnum and wired on. Some of them, such as *citratum*, *hyaloides*, and *falscatum*, may be grown in small pots or Orchid pans. Some *Angræcums* may be kept in cooler quarters when flowering, but when making their growth all should be grown in the highest temperature maintained in the East Indian house, the atmosphere of which should be kept very humid. The cultivator should also attend very closely to watering at this period. When growth has been completed water should be gradually withheld, though the leaves should never be allowed to shrivel through dryness at the root. Give shade in summer when the sun is hot. As the plants come into bloom keep them very warm and the atmosphere dry.

Principal Species :—

caudatum, 1½', Aug., wh.
Has a long dusky spur.
citratum, 6" to 8", lem., sweet.
eburneum, 1½' to 2', wh., strong growing (var. *virens* has a green lip).
Ellisii, 1', My., Je., wh.
falscatum, 4", wh., sweet.
Keep at the cool end of the East Indian house.

Humblotii, 8" to 10", wh.
Leonis (*see* *Humblotii*).
polystachys, 1' to 1½', My., Je., wh., sweet.
sanderianum, 1', spring, wh.
scottianum, 1', wh.
sesquipedale, 2', Jan. to Je., wh.

Other Species :—

apiculatum (*see* *bilobum*).
— *dormanianum*, wh. and sepals tipped verm.
arcuatum, 8", wh. (*syn.* *Listrostachys arcuata*).
armeniaceum, 1', yel., pk.
articulatum, 10", My., Je., wh.
ashantense, 4", Je., cin.
avicularium, 4", wh.
bilobum, 6" Sep., wh.
— *Kirkii*, 4", wh.
— *calligerum*, 4", wh.
bistortum, 6", wh.
caulescens, 1½', Sep., grn., wh.
cephalotes, wh. (*syn.* *Listrostachys*).
chailluanum, wh.
christyanum, 6", grn., wh.
clandestinum, 6" Sep., grn., wh.
cryptodon, 8", wh.
descendens, 10", wh.
distichum (*see* *Mystacidium*).
eichlerianum, 1½', grn., wh.
fastuosum, wh.
florulentum, 1', wh.
Fournieræ (*see* *stylosum*).
fourmerianum, 1', wh.
fragrans, Jan., wh.
funale (*see* *Dendrophylax funalis*).
fuscatum, 6", ochre.
germinyanum, 1½', wh.
gladiifolium, Feb., wh.
glomeratum, 6", wh.
grandidierianum, 4", ivory (*syn.* *Aëranthus grandidierianus*).
henriquesianum, 4", wh.
Hildebrandtii, 4", or., yel.
hyaloides, 4", wh.
ichneumoneum, 1', ochre, wh. (*syn.* *Listrostachys ichneumonea*).
imbricatum, 1½', cream, or.
kimballianum (now *Aëonia polystachya*).
Kotschy, ivory.
micranthum (*see* *Campylotriton*).
modestum, Ap., wh.
o'brienianum, wh.
odoratissimum, wh.
ophioelectron, grn., yel. (*syn.* *Aëranthus*).
ornithorhynchum (*see* *Aëranthus*).
pallidum, 2', wh.
pellucidum, 6", Nov., wh.
pertusum, 6", Oct., wh.
pescatorenum, wh.
primulinum, 6", cream.
ringens, yel., wh. (*syn.* *Listrostachys*).
rostellare, 8", ochre.
Sedenii (a var. of *arcuatum*).
Smithii, 1", br.
stylosum, 6", wh.
subulatum, wh.
superbum, grn., wh.
tenuë (*syn.* *purpurascens*).
Some doubt about this plant).
teretifolium, wh.
tridactylites, 4" to 5", buff.

ANGUILLARIA.

Herbaceous perennials (*ord.* Liliaceæ), requiring the protection of a greenhouse in winter, or a frame from which the frost is just excluded. The rootstock is a small corm encased by the sheathing base of the leaves. Flowers purple, in spikes. Propagated by cuttings in summer, also by offsets and division of the corms when repotting. Soil, light, sandy, friable loam, with one-third of peat.

Principal Species :—

dioica, 1', My. (*syn.* big- indica (*see* *Iphigenia in-*
landulosa). dica).

ANGULOA.

Description.—Large and showy Orchids (*ord.* Orchidaceæ), generally requiring the temperature of the intermediate or Cattleya house, that is, 55° to 60° in winter, and 60° to 65° in summer. The flowers are large, produced singly on stems sheathed with bracts, erect or nodding, yellow, white, and sometimes heavily spotted with purple or crimson.

Propagation.—By division of established plants, retaining a lead to each piece. If the youngest pseudo-bulb or leading growth is cut away, the next older pseudo-bulb will develop another bud (the "back bud" of the Orchid grower).

Soil.—Fibrous peat two-thirds, sphagnum moss one-third, and a little silver sand, if there is none in the peat. The live sphagnum should be chopped.

Other Cultural Points.—Give plenty of moisture at the roots when growing, and maintain a moist atmosphere; but on the advent of winter the plants must be kept cooler and drier, and in a dry atmosphere when in bloom, to prevent the spotting of the flowers. Potting or repotting should be accomplished when the young roots begin to grow. Fill the pots half to two-thirds with clean crocks, and cover this with sphagnum before putting in any compost. Shade while the growths are still young, but not afterwards.

Principal Species and Varieties :—

<i>Clowesii</i> , 1½', My., yel.	<i>— sanguinea</i> , 1½', My.,
<i>— floribus flavis</i> , 1½', My., yel.	red (<i>syn.</i> <i>purpurea</i>).
<i>Ruckeri</i> , 1½', My., yel., cr.	<i>uniflora</i> , 1' 4", cream.
<i>— alba</i> , 1½', My., wh.	<i>— eburnea</i> , 1' 4", wh.
<i>— media</i> , 1½', My., yel., cr.	<i>— Mantini</i> , 1' 4", pk.
<i>— retusa</i> , 1½', My., lem., pur.	<i>— Treyerani</i> , 1' 4", wh., ro.

Other Species :—

<i>dubia</i> , 1' 4", wh., pur.	<i>madouxiana</i> , 1' 4".
<i>grandiflora</i> (<i>see</i> <i>Stanhopea</i>	<i>media</i> , 1' 4".
<i>Bucephalus</i>).	<i>purpurea</i> (<i>see</i> <i>Ruckeri</i>
<i>intermedia</i> (<i>see</i> <i>media</i>).	<i>sanguinea</i>).

ANGURIA.

Stove climbers (*ord.* Cucurbitaceæ), some being herbaceous, others shrubby, evergreen, and climbing to a considerable height. Flowers green, yellow, or scarlet, followed by small oblong or oval fruits, classed as Gourds. Propagated by seeds, also by cuttings of shoots or roots. They are of easy culture in light, sandy soil, in loam and leaf mould, or in loam and peat, using plenty of sand.

Principal Species :—

mackayana, var.; should be trained to the pillars or rafters of a st.
trilobata, 20', Jy., pk.
Warscewiczii, win., sc.

Other Species :—

pedata, 20', Jy., yel. *umbrosa*, 10', Jy., yel.
trifoliata, 10', Jy., yel.

ANHALONIUM.

Dwarf, globose, or tufted succulents (*ord.* Cactææ), allied to *Mamillaria*, with which they are

sometimes united. They differ from the species of that genus chiefly by having triangular, sub-leafy tubercles. Flowers moderate in size. Warm greenhouse treatment, and kept very dry in winter, will meet their requirements. Increase is by seeds; also by offsets from those of tufted habit. Fibrous loam in which there is a large proportion of sand, and soft, red bricks broken up rather finely, will suit.

Principal Species :—

Engelmanni (*syn.* *fissur-* Williamsii.
— atum). — *Lewinii*, 1" to 6".
prismaticum, 6".

ANIGOZANTHOS (*syn.* ANIGOSIA).

Tufted, Sedge-like plants (*ord.* *Hæmodoraceæ*), succeeding in a greenhouse from which frost is just excluded, either in pots or planted out where they will get plenty of light. The green, yellow, purple, or red hairy, tubular flowers, are raised well above the grassy or Sedge-like tufts of leaves, and are both curious and showy. Propagation is by division of the tufts or clumps when repotting in spring. Soil, loam one part, peat two parts, leaf mould one part, with plenty of sharp sand.

Principal Species :—

bicolor, 3', My., sc., grn. The colours make a pretty contrast.
rufa, 2', Je., pur. (*syn.* *tyrianthina*).

Other Species :—

<i>flavida</i> , 3', My., yel., grn.	<i>Manglesii angustifolia</i> , 3',
(<i>syn.</i> <i>coccinea</i> , <i>grandi-</i>	Jy., grn., red.
<i>flora</i>).	<i>pulcherrima</i> , 2½', My.,
<i>fuliginosa</i> (<i>see</i> <i>Macropidia</i>).	yel., wh.
<i>humilis</i> , 1½', red or yel.	<i>tyrianthina</i> (<i>see</i> <i>rufa</i>).

ANISACANTHA.

Dwarf, shrubby plants (*ord.* *Chenopodiaceæ*), with jointed stems and leaves. A cool greenhouse is necessary for their welfare. Propagation is by cuttings of half-mature shoots, in sandy soil under a bell-glass. Light sandy soil with a little leaf mould suits them. Some advocate peat.

Principal Species :—

divaricata, 2', grn.

ANISE.

There are several species of *Pimpinella* (*ord.* *Umbelliferae*), two of them British; but only *P. Anisum*, an annual herb, is grown in gardens for the sake of its leaves, which are used in garnishing or for seasoning certain dishes in the same way as Fennel. The seed is also used in medicine. Propagation is by seeds, which should be sown in lines 1' apart, on a south border, about the end of April, and the seedlings afterwards thinned to 6" in the line. Rather light and sandy soil in a sunny, sheltered position should be chosen for it.

Principal Species :—

Anisum, 1', Je. to Aug., half-hdy. ann., wh.

ANISOCHILUS.

Rather showy biennial or perennial herbs or shrubs (*ord.* *Labiatae*), requiring stove treatment. The flowers are small, but the false whorls are collected in oblong or cylindrical spikes. Propagated by seeds; or more generally by cuttings of half-ripened wood in sandy soil in pots, under a handlight or similar protection. Soil, turfy, fibrous loam, and one-third of peat, with sand.

Principal Species :—

carnosa, 2', Je., Sep., lil.

Ania (*see* *Tainia*).

Animal Manures (*see* *Manures*).

Animated Oat (*see* *Avena sterilis*).

Anisanthus (*see* *Antholyza*).

Anisocampium (*see* *Nephrodium*).

ANISOMELES.

Hairy or woolly greenhouse or stove herbs (*ord.* Labiatae) of evergreen character, allied to *Stachys*, but some are annual. They bear dense or sometimes loose racemes of flowers, after the manner of *Stachys* or *Salvia*. Propagated by seeds in heat in the case of annuals. Cuttings of the perennials may be taken and accorded the necessary heat according to their kind, under a bell-glass or hand-light. Soil, two-thirds good fibrous loam, and one-third leaf soil, with sand. Some use peat instead of leaf mould, but there is little or no nutriment in it.

Principal Species :—

<i>furcata</i> , 1', Aug., grh., bl.	<i>moschata</i> , 2', Aug., grh.,
<i>malabarica</i> , 2', Jy., st.,	pur.
vio.	<i>ovata</i> , 2', Aug., st., pk.

ANNUALS.

This name is given to plants that are raised from seeds, grow, flower, produce seeds, and die within the year. As the roots of annuals die with the tops, the plants do not push growth the second season, though by picking the dead flowers from certain annuals, and not allowing them to ripen seeds, they will flower for two or more years. Sweet and culinary Peas are good types of true annuals. For horticultural purposes annuals are divided into three sections—hardy, half-hardy, and tender.

Hardy Annuals.—The term is applicable to any plant of the above character requiring no protection; but in gardens it is usually confined to flowering annuals that are raised and grown entirely in the open. For summer flowering, hardy annuals should be sown in beds and borders when the soil is in a crumbly condition in March and April. To ensure success, the ground should be deeply dug beforehand, and enriched with decayed stable manure, as the plants enjoy a free root-run and an open situation. Hardy annuals are very effective when sown in small patches in mixed borders or for massing in beds. They may also be sown in rows, and afterwards transplanted. With a fine tilth secured, scatter the seeds thinly, and cover lightly with fine soil. The young plants should be thinned so that they eventually stand about 4 inches apart. The following is a short selection of good hardy annuals :—

<i>Bartonia aurea</i> .	<i>Godetias</i> .	<i>Poppies</i> .
<i>Candytuft</i> .	<i>Larkspurs</i> .	<i>Saponaria</i>
<i>Clarkias</i> .	<i>Mignonette</i> .	<i>calabrica</i> .
<i>Centaureas</i> .	<i>Nasturtiums</i> .	<i>Silene pendula</i> .
<i>Convolvulus</i>	<i>Nemophilas</i> .	<i>Sweet Peas</i> .
tricolor.	<i>Phacelia</i>	<i>Virginian Stocks</i> .
<i>Cornflower</i> .	<i>campanularia</i> .	
<i>Eschscholtzias</i> .		

Hardy Annuals for Spring Flowering.—Beautiful as hardy annuals are in the summer they are equally effective in the spring, and, if care is taken in raising, the plants will stand an ordinary winter with safety. Sow at the end of August and early in September in drills 9 inches apart, in firm and not over-rich soil. Sow thinly, and avoid overcrowding by allowing the plants to stand clear of each other through the winter. Lift carefully in the spring, and transplant where they are intended to flower. It should be remembered that some annuals which are quite hardy will fail to stand the winter if raised too early the previous summer or

Anisogonium (see *Asplenium*).

Anisopetalum (see *Bulbophyllum*).

Annesia of Roxb (see *Euryale*).

Annesia of W. Hook (see *Calliandra*).

left to crowd each other in the seed rows. The following are amongst the most useful for spring blooming :—

<i>Asperula azurea</i> .	<i>Limnanthes</i>	<i>Saponaria calabrica</i> .
<i>Bartonia aurea</i> .	<i>Douglasii</i> .	<i>Silene pendula</i> .
<i>Clarkias</i> .	<i>Nemophilas</i> .	

Half-hardy Annuals.—To this section belong plants that are not perfectly hardy, but will stand a little frost. They play an important part in the furnishing of flower gardens during the summer and autumn, and are raised by sowing seeds in shallow pans or boxes placed in a greenhouse or frame provided with gentle bottom heat, in March and April. The soil should be finely sifted potting mould, and when the little plants have made a pair of leaves above the seed leaves they must be pricked out in a frame or in boxes, about 3 inches apart. The chief points to observe in the successful raising of half-hardy annuals are (1) thin sowing; (2) pricking off the seedlings before they overcrowd each other; (3) growing close to the glass, and giving abundance of air; (4) hardening off and planting in deep, rich soil at the end of May and early in June. The following are included in the half-hardy section :—

<i>African and French</i>	<i>Nemesias</i> .	<i>Scabiouses</i> .
<i>Marigolds</i> .	<i>Phlox Drum-</i>	<i>Summer</i>
<i>China Asters</i> .	<i>mondii</i> .	<i>Stocks</i> .
<i>Lobelias</i> .	<i>Salpiglosses</i> .	<i>Zinnias</i> .

Tender or Greenhouse Annuals.—Compared with the two preceding sections the plants comprising this are not numerous. Greenhouse annuals are raised by sowing seeds in February and March in pots or shallow pans in finely sifted soil. When large enough the seedlings are placed in small pots, and removed to increased sizes as they require it. Balsams and *Rhodanthes* are typical greenhouse annuals, and the first named may be grown into fine specimens.

NOTE.—The various annuals are dealt with under their names, and special articles are devoted to the most important of them.

ANODA.

Hardy or half-hardy herbaceous plants (*ord.* Malvaceæ) with the habit of *Malva*. Leaves more or less hairy, and flowers purple. Propagation is by seeds; also by cuttings in a frame during summer. Any ordinary friable garden soil will do when planted out. Loam, leaf mould, and sand for those grown in pots.

Principal Species :—

<i>crenatiflora</i> , 2', grh., grn.	<i>hastata</i> , 2', Jy. Aug., hdy.,
(<i>syn.</i> <i>parviflora</i>).	pur.
<i>dilleniana</i> , 3', Jy., grh.,	<i>Ochsenii</i> (see <i>Abutilon</i>).
pur. (<i>syn.</i> <i>Sida cristata</i>).	<i>Wrightii</i> , 2', Jy. Aug.,
	hdy., pur.

ANÆCTOCHILUS.

Description.—Highly ornamental terrestrial Orchids (*ord.* Orchidaceæ) of creeping habit, succeeding best in a moist stove, or in the East Indian house, under the protection of cases or bell-glasses. They are valued chiefly for the handsome foliage. The colours given below refer to the leaves only. Remove the flowers of the others as soon as discernible, as this assists the foliage.

Propagation.—By division of the fleshy, creeping rhizomes or stems, retaining a bud to each piece, with some roots when obtainable. Keep close till fresh roots are formed.

Soil.—Fibrous peat, chopped sphagnum, some finely broken soft red bricks or potsherds, and

Anodontea (see *Alyssum*).

sand. A little fibrous loam may be used. Fill the pans three parts full of clean crocks.

Other Cultural Points.—Some of the most successful cultivators grow them in large pans, continually covered or sheltered with bell-glasses, slightly tilted by placing a small piece of wood or slate under one edge so as to encourage a gentle circulation of air and prevent damping.

Principal Species and Varieties :—

argyoneurus, 6", olive with silvery veins.
concinus, 6", olive grn., with gold red ribs, and netted with the same colour.

Heriotii, 6", mahogany, veined with gold and lightly netted.

hieroglyphicus, 6", dark grn., marbled with silvery grey blotches.

Lansbergiae, 4", velvety grn., netted emerald and edged old gold.

Lowii, 6", olive grn., netted coppery (correct name *Dossinia marmorata*).

— virescens, 6", leaves brighter grn.

ornatus, 6", velvety olive, with broad gold band, and netted red gold.

regalis, 6", velvety grn., netted with golden veins.

One of the most handsome (*syn. setaceus*).

— albo-marginatus, 6", edged wh.

— cordatus, 6", blotched with gold.

— grandifolius, 6", netted with gold on a grn. ground.

— inornatus, 6", velvety grn.

sanderianus, 6", dark olive, netted gold (*see Macoules sanderiana*).

Veitchii, 6", velvety, with wavy golden lines.

Other Species and Hybrids :—

argenteus (*see Physurus pictus*). (correctly *Argyrorchis javanicus*).

argyreus, 6", silvery.

Boylei, 6", olive grn., veins gold.

Bullenii, 6", striped copper red.

chrysoprasus, 6", coppery, netted grn.

dawsonianus and d. pictus (*see Hemaria discolor dawsoniana*).

Dayi, 6" (*see Dossinia marmorata Dayi*).

Dominii, 6", olive grn., pale ribs.

Eldorado, 6", dark grn., pale veins.

Frederici-Augusti, 6", dark grn., or. rib.

inscriptus, 6", olive, netted red gold.

intermedius, 6", olive, netted gold.

javanicus, 6", olive grn.

latimaculatus, 6", grn., silver mark.

Meinertii, 6" (*see Dossinia*).

nevilleianus, 6", grn., or. yel. veins.

ordianus, 6", grn., silvery veins.

Ortgiesii, 6" (*see Physurus*).

pictus, 6" (*see Physurus*).

querceticolus, 6" (*see Physurus*).

Reinwardtii, 6", bronze, gold lines.

Roxburghii, 6".

Ruckeri, 6", pale spots in six lines.

Schæleri, 6", striped silver.

setaceus (*see regalis*).

striatus (*see Zeuxine regia*).

Turneri, 6", bronze, yel. veins.

zebrinus, 6", striped copper.

ANOGANTHUS.

Bulbous plants (*ord. Amaryllidæ*) more closely allied to *Sternbergia* than *Cyrtanthus*, having the straight-tubed flower of the former. They require cool greenhouse treatment, such as is given to *Cyrtanthus*. When resting, keep cool and dry. Propagation is by seeds and offsets, the latter when repotting. Good substantial fibrous loam, a little leaf soil, and sand to keep it open, suit. Put the bulbs well down.

Principal Species :—

breviflorus, 9". My., bright yel. (*syn. Cyrtanthus lutescens* of gardens).

ANOMATHECA.

Dwarf, bulbous, rather tender plants (*ord. Iridæ*), now referred to *Lapeyrouisia*, with bright flowers;

suitable for pots or borders in mild climates. Propagated by seeds or offsets, and thriving in light and rather sandy soil. Frame culture is very suitable for these plants, except *grandiflora* and *junceae*, which require a greenhouse, and may be either grown in pots or planted out. Seeds sown in the open when ripe will give flowers the following year.



ANOMATHECA CRUENTA.

Species :—

cruenta, 6" to 1', Jy., crim. Very beautiful (*syn. Lapeyrouisia cruenta*).
grandiflora, 1', Sep., Oct., sc. (*syn. L. grandiflora*).
junceae, 9", Je., pk. (*syn. L. juncea*).

ANOMOCHLOA.

A perennial Grass (*ord. Gramineæ*) requiring stove heat. The leaves are arranged in two ranks. The flowers are in terminal spikes. Propagated by seeds, also by division of the tufts. Fibrous loam, leaf mould, and sand suit.

Only Species :—

marantoidea, 10", st.

ANONA.

Evergreen trees and shrubs (*ord. Anonacæ*) with fragrant foliage, and requiring stove heat. They furnish various fruits in tropical countries, and have different names according to the species, such as Sour Sop, Custard Apple, Alligator Apple, and Bullock's Heart. Propagated by seeds in pots plunged in a hotbed in spring. Also by cuttings of ripened wood in a propagating case in strong

heat. Soil, substantial fibrous loam, a little leaf soil, and sand.

Principal Species :—

Cherimolia, 18', Aug., br. The Cherimoyer, a delicious fruit from Peru.

muricata, 10', grn., yel. The Sour Sop of the W. Indies.

palustris, 15', yel. The Cork-wood or Alligator Apple.

reticulata, 20', pale yel., br. Bullock's Heart or Custard Apple.

squamosa, 20', wh., grn. The Sweet Sop.

Other Species :—

amplexicaulis, 12', yel., grn.

asiatica, 12', yel., grn.

cinerea, 15', yel., grn.

glabra, 16', Aug., br.

laurifolia, 15', br.

longifolia, 20', pur.

mexicana, 12', yel., grn.

mucosa, 12', yel., grn.

obtusifolia, 15', yel., grn.

paludosa, 4', grn.

punctata, 12', yel., grn.

rhizantha, 15', red.

seuegalensis, 10', yel., grn.

ANOPTERUS.

Evergreen shrubs (*ord.* Saxifragæ) of dwarf habit, with large and showy white flowers, requiring the shelter of a greenhouse, though very nearly hardy. In Cornwall, the Scilly and Channel Islands, they would probably succeed with the shelter of a wall. Handsome as pot plants for the conservatory. Increased by cuttings of half-ripened wood in sandy soil and peat. Fibrous loam two parts, peat one part, and a good dash of silver sand, suit.

Principal Species :—

glandulosus, 1½' to 3', Ap., wh. Flowers sometimes tinted pk.

ANREDERA.

A perennial twiner (*ord.* Chenopodiaceæ) with a tuberous root and slender, very smooth, angled stems, and fleshy entire leaves. Flowers small, white. Propagation is by cuttings of half-ripened shoots under a bell-glass. Light, sandy, friable loam suits.

Only Species :—

spicata, wh. (*syn.* *scandens*).

ANSELLIA.

Rather tall and erect growing Orchids (*ord.* Orchidaceæ), allied to *Cymbidium*, and requiring moist stove treatment, with an abundant supply of moisture at the roots and in the atmosphere when making their growth. During winter, and when in bloom, they may be kept a little cooler, with less moisture at the roots and drier overhead. Propagation is by division of the plants when the flowering period is over and the young roots commence to push out. Fibrous or turfy loam two-thirds, fibrous peat with most of the fine material shaken out one-third (or chopped sphagnum may be employed instead of peat), with some silver sand, suit.

Principal Species and Varieties :—

africana, 3', Feb., yel.,

br.

confusa, 3', Feb., yel., br.,

pur.

congoensis, 3', Feb., yel.,

br. spots.

gigantea, 3', Feb., yel., br.

— *citrina*, citron, un-

spotted.

— *lutea*, yel.

humilis, 2', Feb., lemon

yel., chocolate.

— *pallida*, ground colour

milk wh.

nilotica, 2', Feb., yel.,

pur. spots.

— *rossiana*, 2', Feb., pale

yel.

ANT.

Ants (*emmetts*) are a source of considerable worry in gardens. They are particularly fond of

Anonymos (*see* *Zornia*).

Anoplangthus (*see* *Phelipæa*).

Anoplophytum (*see* *Schlimbergia* and *Tillandsia*).

the sweet fluids which they extract from ripe fruits of Cherries, Apricots, Peaches, Plums, Apples, and Pears. Ants invariably follow in the wake of aphides, eating the sweet, sticky fluid which the latter exude and leave on the foliage of infested plants. They tap the insects with their antennæ. Young partridges are very fond of the pupæ of ants, which are found in colonies under mounds raised by the insects in pasture fields. Where colonies of ants are accessible they may be destroyed by digging out the nests, immersing them in boiling water, and mixing gas lime with the soil. A strong decoction of stewed Elder leaves poured into the nest at night is a good means of destruction; and another remedy consists of placing a few lumps of camphor in a can of water, and sprinkling it about their haunts. Large numbers of the insects may be caught by placing meat bones near the nests. The ants are attracted by them, and are easily destroyed with boiling water. The pests may be poisoned in the spring with mercurous chloride. Take calomel one part, and finely powdered sugar eleven parts. Mix well together, and place the compound in small heaps near the nest. The Ants eat the mixture and perish. To prevent Ants creeping up the stems of espalier fruit trees fasten pieces of wool round at a short distance from the ground.

ANTENNARIA.

Description.—Neat little hardy herbaceous plants (*ord.* Compositæ), of small value as flowering plants, but very suitable as a carpet over bulbs or under taller flowers which require some dwarf plant underneath to show their forms to advantage. The leaves are white or silvery, and the plants are very ornamental on rockwork.

Propagation.—By seeds sown under glass in spring, or by division of the roots at the same season.

Soil.—That of a light and sandy character is best.

Other Cultural Points.—The dwarf Antennarias may be used for covering the soil above such bulbs as Snowdrops, Crocuses, or others which flower early, in order to prevent the places from being bare late in the season. They should, however, be in a sunny place so as to bring out the whiteness of the leaves. They do well on terraces of the rock garden.

Principal Species :—

dioica, 3' to 4', Je., pk. or wh. A pretty native species, of which there are two or three varieties, that named *dioica rosea* being attractive. *Minima* is of very dense growth.

tomentosa, 1', sum., wh. One of the closest growing of all our wh. leaved carpeting plants, and of almost snowy whiteness in a congenial position. It is as well to keep its flowers clipped off (*syn.* *candida*).

Other Species :—

alpina, 1' to 4', Je., wh.

carpathica, 6", My., wh.

margaritacea, 2', Aug., wh.

(*see* *Anaphalis margaritacea*).

plantaginea, 9", My., wh.

triplinervis, 2', Jy., wh.

(*see* *Anaphalis triplinervis*).

ANTHEMIS. (CAMOMILE.)

Hardy border or rock garden plants (*ord.* Compositæ) mostly of a herbaceous character, many being very useful and appreciated for cutting. Propagated by division or seed in spring or autumn. Any common soil will suit almost all the plants, which are quite hardy. The Alpine species like gritty soil and sun.

Principal Species :—

Aizoon (*see* *Achillea ageratifolia*).
carpathica, 6", Je., wh. A neat Alpine.
macedonica, 8", Je., wh. One of the best for
rockeries.

montana, Aug., Sep., wh. or pur. (*syn.* *saxatilis*).
nobilis, 1', Aug., wh. The common Chamomile.
tinctoria, 2', Jy., etc., yel. The Dyer's Chamomile, a good border flower. There are several
varieties, such as *Kelwayi*, *pallida*, *Canary Bird*,
and *Mrs. H. T. Brooks*, which are all improvements.

Triumfettii, 1½', Je., yel. A good border plant

Other Species :—

retensis, 6", Jan., wh. biebersteiniana, Je., yel.
Barrelieri, 1', Aug., wh. (*syn.* *marshalliana*).
(*Achillea Barrelieri*). cinerea, wh., grey lvs.
(*see* figure).

flowering, though it may be delayed if necessary
until autumn. The Anthericums make very ornamental
pot plants when grown in a rich soil and
bloomed under glass in a cool or cold house. Large
pots filled with two parts of fibrous loam, one of leaf
mould, and a half each of rough sand and decomposed
manure, will be necessary. After flowering
place outside. They must not be allowed to suffer
from drought at any time.

Principal Species :—

Liliago, 1½', Je., wh. St. Bernard's Lily, a very
pretty plant with racemes of small Lily-like flowers.
The variety major is more desirable than the type
(*syns.* *Watsonia Liliago* and *Phalangium Liliago*).

Liliastrum, 2', Je., wh. St. Bruno's Lily, a
charming border flower, with larger flowers than
the preceding. There is a superior form named
major. This grows as much as 5' high (*syns.*



Photo: W. H. Wattle.

ANTHEMIS CINEREA.

ANTHEPHORA.

Branched or tufted, sometimes tall, Grasses (*ord.*
Gramineæ), requiring the protection of a warm
greenhouse in winter. The inflorescence consists
of green spikelets arranged all round the axis,
or in some species all directed to one side. They
are of the easiest culture. Propagation is by
seeds in March and April in heat, also by division
of the stools or tufts. Fibrous loam, leaf mould,
and sand will meet their requirements. Some use
peat instead of leaf mould, but it is unnecessary.

Principal Species :—

elegans, Aug., grn. villosa, Aug., grn.

ANTHERICUM.

Description.—Very ornamental garden plants
(*ord.* *Liliacæ*) with white flowers and long narrow
leaves. All those named are hardy unless otherwise
mentioned. The plant known as *A. Liliastrum* is
spoken of here, although it is now named *Paradisea*
Liliastrum.

Propagation.—By division of the roots immediately
after flowering, or by seeds sown when ripe
in a frame or in pots in a greenhouse.

Soil.—A good, rich, well-manured soil is needed
to grow these plants well.

Other Cultural Points.—Plants to be grown outside
should be planted as early as possible after

Paradisea Liliastrum, the proper name, and *Czackia*
Liliastrum).

ramosum, 2', Je., wh. Smaller than the foregoing,
and less attractive (*syn.* *grawinifolium*).
A var. of this is called *Dorsetii*.

Other Species :—

canaliculatum, 1', Jy.,	revolutum, 2', grh., wh.
grh., wh.	undulatum, 1½', Je., grh.,
croceum, 1', Je., wh.	wh.
echeandoides, 1', Nov.,	variegatum, 2', grh.,
grh., yel.	wh., variegated. Now
falcatum, 1', Jy., grh.,	<i>Chlorophytum elatum</i>
wh.	variegatum (<i>syns.</i> <i>Pha-</i>
Gerrardii, 9", Oct., grh.,	langium argenteo-lin-
wh.	ear and <i>Anthericum</i>
makoyanum, 2½', varie-	<i>Williamsii</i>).
gated leaves.	

ANTHOCERCIS.

Dwarf or moderately tall New Holland shrubs
(*ord.* *Solanacæ*), succeeding with greenhouse treatment,
either in pots or planted out. The flowers
are white or yellow, often purple or striped inside,
and very pretty, in terminal racemes or panicles.
Propagation is by cuttings of the ripened wood
taken in spring, inserted in very sandy soil, placed
under a bell-glass. Fibrous loam and peat in equal
proportions, with plenty of sand to ensure drainage;
suit.

Principal Species :—

albicans, 3', Je., wh. ilicifolia, 3', Je., wh.
 floribunda, 3', My., Je., littorea, 3', Je., wh.
 wh. viscosa, 6', My., wh.

ANTHOCLEISTA.

Trees or shrubs (*ord.* Loganiaceæ) and some of them climbers from Tropical Africa, requiring the heat and moisture of a stove. Flowers white or yellowish, and moderately large (1½" across in some cases). Propagation is by cuttings under a bell-glass or in a propagating case. Soil, peat and loam, in the ratio of one part of the former to two of the latter, with some silver sand.

Principal Species :—

insignis, 70', yel. macrophylla, 20', wh.

ANTHODON.

Trees and shrubs (*ord.* Celastrineæ) of tropical or sub-tropical regions, and sometimes joined to Salacia. Foliage evergreen. Flowers generally in clusters, yellow and green, followed by berried fruits. Propagated by cuttings of moderately-hardened wood under a bell-glass, in heat. Loam, leaf mould, and sand suit; or peat may be used instead of leaf mould. Stove heat is essential.

Principal Species :—

ellipticum, 12', yel., grn. paniculatum, 12', yel., grn.

ANTHOLOMA.

Tall shrubs or low trees (*ord.* Tiliaceæ), requiring the heat of a stove. Propagated by cuttings of mature wood in sand, inserted in pots, and placed in a propagating case. Sandy, fibrous loam, with some good leaf mould, will meet the requirements.

Principal Species :—

montana, 20', My., st., wh. May be grown in tubs or planted out.

ANTHOLYZA.

Description.—Striking bulbous plants (*ord.* Iridæ) with long spikes of flowers and handsome Iris-like leaves. They are unlike most other flowers of their season, and should be more grown, either under glass or outside.

Propagation.—By offsets, taken off when the plants are at rest, or by seeds sown under glass in spring.

Soil.—Sandy loam, leaf mould, and peat, in equal proportions, form a good compost for pot culture; but they will grow in almost any good soil.

Other Cultural Points.—The greater number are hardy, if planted about 8" deep, and mulched in winter with Cocoanut fibre or dry litter. They may, however, be lifted and stored like Gladioli, planting in pots or in the open being done in March. Frame culture is also suitable.

Principal Species :—

æthiopica, 4', Je., red, yel. A handsome plant (*syns.* præalta, ringens, and floribunda). The var. vittigera has more yel.

paniculata, 4', Jy., red, yel. Perhaps the finest and hardiest. Very striking, even when not in flower. Leaves broad and ribbed.

Other Species :—

caffra, 3', Jy., red (*syn.* montana (*see* Gladiolus).
 Anisanthus splendens. quadrangularis, 2', Ap.,
 Cunonia, 1½', Jy., red (*syn.* yel., red.
 Anisanthus Cunonia). spicata, 2', Jy., red.

ANTHOMYIA.

A genus of flies, many species of which are destructive to plants (*ord.* Diptera). The perfect insect is a brown, black, or ochreous two-winged fly, with a hairy body. Pupæ oval and red brown or ochreous in different species. The larva or maggot is white or dirty white, smooth or

hairy, legless, and furnished with two hooks at the mouth by which it pierces its way into the roots of the plants on which it feeds. This stage of the fly is the only one that damages or destroys plants.

Principal Species :—

Betæ. The Beet Fly. platyura. Shallot Fly.
 Brassicæ. Cabbage Fly, radicum. Root-eating
 also on Cauliflower and Fly. Roots of Cabbage,
 Turnips. Turnip, and Radish.
 Ceparum. Onion Fly. tuberosa. Potato Fly.
 floralis. Radish Fly. Tubers of Potatoes.
 Lactucæ. Lettuce Fly.

See the various crops named.

ANTHONOMUS POMORUM.

(APPLE BLOSSOM WEEVIL, *see* APPLE ENEMIES.)

ANTHOSPERMUM.

South African shrubs (*ord.* Rubiaceæ) with small leaves, sometimes resembling those of a Heath, as in æthiopicum. The species mentioned below has evergreen leaves and small brown or green flowers. Propagated by cuttings in very sandy soil, under a bell-glass in a warm or intermediate greenhouse. Equal parts of peat and fibrous loam with a good dash of sharp silver sand will meet the requirements.

Principal Species :—

æthiopicum, 2', Je., grh., br. or grn. The Amber Tree. The leaves are fragrant when bruised.

ANTHOXANTHUM.

A genus of a few species of Grasses (*ord.* Gramineæ) belonging to temperate parts of the globe. Odorum (Sweet Vernal Grass) is the only British species, and is supposed to be the principal source of the sweet odour emitted by new-made hay. The active principle of this scent is known as coumarin. The plant is a hardy perennial of the easiest culture. Propagation is by seeds, and by division of the tufts, the former being the chief method of increase. Any soil will suit it if not too much shaded by houses or trees.

Principal Species :—

odoratum, 1', My. to Aug., Puelii, 6", Je., hdy,
 Sweet Vernal Grass. grn.

ANTHURIUM.

Description.—A large genus of stove plants (*ord.* Aroidæ), containing many garden hybrids, bearing attractive flowers of great substance. The ornamental leaved species produce handsome foliage of velvety texture, and are amongst the most attractive of stove plants. Being natives of tropical countries, Anthuriums require a warm temperature.

Propagation.—By division of the crowns, and from seeds. The former is a common method of increasing plants. The crowns may be taken off in the spring, but not until they have formed a few roots at the base, and are, in a measure, independent of the parent plant. If the crowns are taken off before roots are formed they are a long time starting into growth. Several of the flowering species, including scherzerianum, produce seeds, which vegetate freely if left on the plants till they are thoroughly matured. The seed vessels become orange red in colour as they ripen in the spring, and when fit to remove the seeds should be washed out of the pulp and at once sown. Fill a shallow seed pan with a mixture of fresh sphagnum moss, with about one-sixth of clear white sand added, and a few small broken crocks or pieces of charcoal. Press the material firmly down, sprinkle well with water, and dust a little sand on the surface. Scatter the seeds

evenly, and press them down gently, but do not cover them. Place a square of glass over the pan to conserve moisture, and stand the receptacle in a temperature ranging from 65° at night to 75° in the daytime. The atmosphere and surroundings must be kept moist, and if the material gets dry water carefully through a fine rose. Under this treatment the seeds will germinate in a few weeks.

Soil.—Being much inclined to root near the surface, Anthuriums do not require a great depth of soil, but ample drainage must be provided. The pots should be half filled with crocks, and a suitable compost is formed of three parts fibrous peat, pulled into pieces, and one part leaf mould, with a free sprinkling of silver sand, and sufficient pieces of crocks and charcoal broken small to keep the compost open. For the flowering species add one part of clean sphagnum moss.



Photo: H. Cotton, Ashford.

ANTHURIUM VEITCHII DWARFED.

(A wire girdle was placed round the stem and packed with moss, which was kept damp. It was left for a year, and the stem was then sawn through below the girdle. The plant was repotted and the old rootstock thrown away.)

Other Cultural Points.—Crowns taken from old plants in the spring should be placed in pots large enough to accommodate them, pressing a little soil over the roots, and supporting the plants with a short stick. They should be kept close in a moist temperature ranging from 65° to 75° till growth commences. Supply larger pots as growth increases, and grow through the summer in a stove temperature. Shade from hot sunshine, and give ample moisture by watering and syringing. Reduce the temperature in the winter to 55° at night and 60° by day, and give less water, but do not let the plants get very dry. Repot in April, using material a little rougher than before. Under this treatment the plants will quickly increase in size. When it becomes necessary to reduce them, it may be done by division of the crowns. Plants raised from seeds sown in the spring are ready for pricking off at the end of the summer. Place them in

small pots, using material similar to that in which they were raised. Keep the compost moist, and winter in a temperature of from 55° to 65°. Shift the plants in the spring, using a little peat this time, and grow through the summer in a warm, moist atmosphere, ranging from 65° to 75°. As they become established, reduce the temperature in the winter, and water more sparingly during that period. Never allow the soil to become sour, and when potting remove as much of the old material as possible without injuring the roots. A good time to repot established plants of *schzerianum* is after the blooming is over in the summer.

Principal Species and Hybrids (Flowering):—

A large number of species are included in the genus, but many of them, being of minor importance, are omitted in favour of the more popular. Selections of the best species, hybrids, and varieties are given in the following lists.

andreaeanum, spathe sc.,	— lacteum, wh.
spadix wh.	— maximum, sc., large
— album, wh., effective.	flower.
— Allendorffii.	— mutabilis, spathe wh.,
— atropurpureum.	changing to sc.
— atrosanguineum, dark	— nebulosum, spathe wh.,
red.	dusted red.
— delicatum, ro.	— pygmaeanum, sc., small
— Grusonii.	flower.
— Kolbii.	— rothschildianum,
— Ortgiesii.	spathe spotted red,
— Wittmackii.	spadix cream.
ornatum, spathe wh.,	— vervaneum, spathe
spadix pur.	wh., tipped red.
schzerianum, spathe and	— Wardii, spathe and
spadix sc.	spadix sc., large.
— albo-lineatum.	— warocqueanum, spathe
— andagavense, spathe	wh., spotted red, spadix
spotted crim. and wh.	yel.
— bispataceum, red.	Williamsii, spathe wh.,
— duvivierianum, spathe	spadix cream (<i>syn.</i>
wh., spadix or.	<i>schzerianum album</i>).
— giganteum, red.	

Principal Species (Ornamental Leaved):—

Brownii, 3' to 5', leaves	Veitchii, 2½', leaves deep
3' long, vigorous.	grn., a fine foliage
crystallinum, 2', leaves	plant.
grn., pale veins.	— acuminatum, tapering
magnificum, leaves grn.,	leaves.
white veins.	warocqueanum, 3', leaves
regale, leaves grn., pale	grn., wh. veins.
veins.	

Other Species and Hybrids:—

acaule, 3', grn. or vio.	Kalbreyeri, a climber,
Anbletii, grn.	grn.
Bakeri, 1', grn., sc. berries	lawrenceanum, grn., hyb.
bellum, 3', grn.	leuconeum, grn.
Binotii, 1', olive grn.	lindenianum, 3', spathe
bogotense, grn.	wh., spadix wh., pur.,
burfordiense, sc.	fragrant.
Chamberlainii, spathe	macrophyllum, 2½', glaucous
crim., spadix red pur.	pur.
cordifolium, 2½', grn.	metallicum, grn.
coriaceum, 3', grn.	mortfontanense, spathe
cruentum, blood red.	crim., spadix wh.
cuspidatum, 2½', red pur.	nymphaefolium, spathe
ferrierense, red.	wh., spadix pur.
fissum, 2', grn.	purpureum, 2', pur.
Fröbelii, car.	signatum, 1½', grn.
geitnerianum, 2½', gr.	subsignatum, 1½', grn.
Harrisii, spathe grn.,	tetragonum, grn.
spadix vio. br.	triumphantum, spathe grn.,
— pulchrum, spathe wh.,	spadix wh.
spadix crim., leaves	violaceum, vio. berries.
variegated.	Wallisii, 2½', grn.
Hookeri, 3', spathe grn.,	Wildenowii, spathe grn.,
spadix grn. or vio.	spadix br. (<i>syn. lanceo-</i>
insigne, bronzy leaves.	latum).

ANTHYLLIS.

A large genus (*ord.* Leguminosæ) of annual and perennial herbaceous plants, mostly hardy, but containing a few half-hardy species of a sub-shrubby character. They are closely allied to the Clovers, having their flowers in dense heads or clusters, but with more than three leaflets. The flowers vary from white and yellow to rose and purple. Propagation is by seeds; the herbaceous species also by cuttings under a handlight in summer, and by division of the tufts in spring. The shrubby species by cuttings in summer. As they grow naturally in sandy or chalky soil in dry places, the rockery is the best place for them; they also succeed in light, well-drained borders. The half-hardy species may have a third part of peat.

Principal Species and Varieties:—

<i>Erinacea</i> , 1½', Ap., grh., pur. (now <i>Erinacea pun-</i> <i>gens</i>).	— albiflora, 1', Jy., hdy., wh.
<i>montana</i> , 1', Je., hdy., pur.	— Dillenii, 1', Jy., hdy., red.
— alba, 1', Jy., hdy., wh.	— hirsutissima, 6'', Jy., hdy., red.
— atrorubens, 1', Jy., hdy., dark red.	— polyphylla, 1', Jy., hdy., vel.
<i>Vulneraria</i> , 1', Jy., hdy., yel., British.	— rubriflora, 1', Jy., hdy., red.

Other Species:—

<i>alpina</i> , 1', Aug., hdy., yel.	<i>Hermannia</i> , 2', Ap., grh., yel.
<i>Aspalathii</i> , 1', Jy., grh., yel.	<i>heterophylla</i> , 1', Jy., grh., pk.
<i>Barba-Jovis</i> , 4' to 8', Ap., grh., pale yel.	<i>lotoides</i> , 1', Jy., hdy. ann., yel.

ANTIARIS.

Description.—Evergreen trees (*ord.* Artocarpaceæ) from the East Indies and Malayan Archipelago, and requiring a moist stove heat. *Toxicaria* is the Upas Tree of Java, concerning which many fables have been told. The leaves are not unlike those of an Elm. The milky juice that issues from the bark when punctured is very poisonous, proving fatal in from fifteen to thirty minutes when introduced to the blood of a victim.

Propagation.—By cuttings of mature wood in the moist heat of a propagating case.

Soil.—Fibrous, mellow loam, with one-third of peat and sufficient sand to ensure porosity, will make a good compost.

Principal Species:—

Toxicaria, 40' to 90', st. The Upas Tree of Java.

ANTIGONON.

Tall climbers (*ord.* Polygonaceæ) from Mexico and Central America, in a wild state clinging to their supports by the twisting leaf stalks. The small flowers increase in size with age, becoming showy and so highly conspicuous that they have been compared to Bougainvilleas. Under cultivation they have proved difficult to flower, having been tried in stoves, greenhouses, and in the open air in summer. They require to attain some age and height, to have their roots restricted to a narrow, well-drained border, and to be trained up under the glass so as to get all the air and sunshine possible. Probably a dry stove would be conducive to the early production of flowers. Propagation is by imported seeds; and by cuttings of half-ripened wood in heat. Fibrous loam of a light and sandy character, well drained if in borders, suits

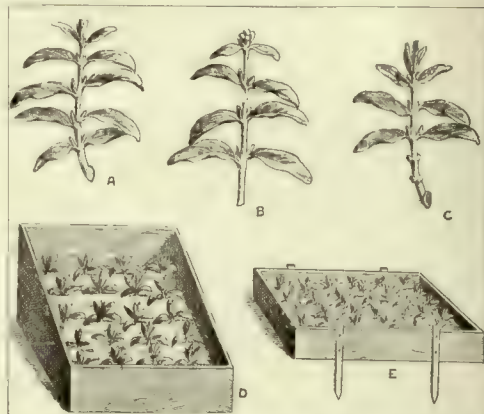
Principal Species:—

<i>amabile</i> , st., ro.	st., crim. The best
<i>insigne</i> , st., ro. pk.	known.
<i>leptopus</i> , Aug. to Oct.,	— albiflorum, st., wh.

ANTIRRHINUM. (SNAPDRAGON.)

Description.—Mostly hardy herbaceous annual and perennial plants (*ord.* Scrophularineæ). Of the latter there are now many varieties largely grown in gardens. The common Snapdragon, *A. majus*, grows freely on the tops of old walls and ruins, multiplying rapidly in such positions. Tall garden varieties are suitable for planting in mixed borders, and the dwarf forms are excellent for small beds.

Propagation.—From seeds and cuttings. Sow in a bed outdoors in August in drills, and transplant the following spring. Though perfectly



ANTIRRHINUM (SNAPDRAGON) FROM CUTTINGS.

A A cutting removed with a heel, good.
B A cutting with flower buds, bad.
C A cutting ready for insertion.
D Cuttings inserted in a frame.
E Cheap home-made box-frame.

hardy, the best varieties of Antirrhinums may be flowered within six months of the date of sowing by treating them as half-hardy annuals. Sow the seed in heat in February, prick off the plants when large enough, gradually harden, and put out about the middle of May. Propagation from cuttings is a ready way of increasing Antirrhinums. Take off young growing shoots in September and October, and insert them in a bed of sandy soil in a cold frame or under a handlight. Put out the plants before they overcrowd each other, in the spring.

Soil.—Antirrhinums will flourish in any ordinary garden soil that is not too retentive of moisture.

Other Cultural Points.—Beds of Antirrhinums in distinct colours are very effective, and to prolong the season of blooming the old flower spikes should be kept picked off. When grown in mixed borders the native species seed freely and rapidly increase themselves.

Principal Species:—

<i>majus</i> , 2', Jy., pk., of which the following are varieties:—	— coccineum, 2', Jy., sc.
— bicolor, 2', Jy.	— flore pleno, 2', Jy., flesh.
	— variegatum, 2', Jy., red.

Other Species:—

<i>alpinum</i> (see <i>Linaria</i> <i>alpina</i>).	<i>glandulosum</i> , 2', Sep., yel.
<i>angustifolium</i> (see <i>sicu-</i> <i>lum</i>).	<i>Linaria</i> (see <i>Linaria vul-</i> <i>garis</i>).
<i>calycinum</i> (see <i>Orontium</i>).	<i>Orontium</i> , 1', Aug., flesh (<i>syn.</i> <i>calycinum</i>).

Antigramme (see *Scolopendrium*).

ANTROPHYUM. (Including *SCOLIOSORUS*.)

A small genus of Ferns (*ord.* Filices) almost confined to the tropics. Fronds simple, firm, and fleshy. They require a moist stove temperature for their well-being, and shading in summer. Propagation is by division of the rootstock at the time of potting. Fibrous mellow loam two parts, peat one part, and plenty of sharp sand, suit.

Principal Species :—

lanceolatum, 1'. *plantagineum*, 6" to 9"
latifolium, 6" to 12". (*syn.* Lessonii).
Lessonii (*see plantagineum*). *reticulatum*, 6" to 18".

ANUBIAS.

A dwarf Aroid (*ord.* Aroideæ), having leaves 1' long and 3" broad, and small, inconspicuous flowers, so that it is grown solely as a fine foliage plant, requiring a moist stove heat. Propagation is by seeds; also by division of the rhizomes, having a bud to each piece. Fibrous loam, broken off by hand, with an equal proportion of peat, the whole mixed with sand and some finely broken potsherds, suit.

Principal Species :—

heterophylla, 1', grn. The bright grn. leaves are blotched with yel.

AOTUS.

Very graceful and mostly slender, twiggy, evergreen shrubs (*ord.* Leguminosæ) of dwarf habit, and thriving well in a cool greenhouse. Flowers yellow, and in some species blotched with crimson. They do well when treated like *Cytisus* and cut back after flowering. Propagation is by seeds in heat; also by cuttings of short side shoots or the tops of others when getting fairly firm, in sandy soil and placed under a bell-glass or hand-light in moderate heat, in the same way as *Cytisus*. Loam and peat in equal proportions, with plenty of clean, sharp sand, pressing it rather firmly in potting or repotting, suit.

Principal Species :—

gracillima, 3', My., yel. crim. The best and most frequently cultivated species.

Other Species :—

gracilis, 3', Ap., yel. — *ericoides*, 2', Je., yel.
incana, 2', Je., yel. — *ferruginea*, 2', Je., yel.
laugiera, 2', Ap., cr. yel. — *virgata*, 2', Je., yel.
villosa, 2', Ap., yel.

APEIBA (*syn.* *AUBLELIA* of Schreber).

Rather tall evergreen trees and shrubs (*ord.* Tiliaceæ), requiring a stove temperature. Flowers rich yellow. In order to restrain their rampant vigour, to keep them within due bounds, and conduce to flowering, they should occasionally be root pruned. Propagation is by cuttings of mature wood in a propagating case. Fibrous loam, with a third of leaf soil and a liberal quantity of sand, when grown in pots or tubs, suit.

Principal Species :—

aspera, 30' to 40', My. *Petoumo*, 40', Aug.
lavis, 10'. *Tibourbou*, 10', Aug.

APERA (*syn.* *ANEMAGROSTIS*).

A genus of tufted annual or perennial and hardy or nearly hardy Grasses (*ord.* Gramineæ), having slender and very graceful panicles of flowers. *Arundinacea* is hardy, or nearly so, and makes a handsome subject in pots for the front stages of a conservatory. The whole stem is extremely slender and hangs down, so that it would make a

Aopla (*see Herminium*).

Apargia (*see Leontodon*).

useful basket plant of the easiest culture. Propagation is by seeds or by division of the tufts. Loam, sand, and leaf mould, with good drainage, suit.

Principal Species :—

arundinacea, 2' to 3', Aug., Sep., half-hdy., reddish (now *Stipa arundinacea*).

Spica-venti (the correct name of *Agrostis Spica-venti*).

APHÆREMA.

A small stove shrub (*ord.* Samydaceæ) of slender and graceful habit, producing its golden yellow flowers in racemes terminating the stem or branches. It is propagated by cuttings of half-ripened shoots under a bell-glass. Use a compost of two-thirds fibrous loam, and one-third of leaf mould and sand.

Only Species :—

spicata, 1½' to 2', gold yel.

APHELANDRA.

Description.—Stove evergreen shrubs (*ord.* Acanthaceæ) of dwarf habit, several of them appearing almost like herbaceous plants when annually propagated from cuttings. Flowers always showy, but often supplemented by large, coloured bracts more persistent than the flowers. The dark green leaves of some species are banded with grey along the principal nerves, so that they may be regarded as fine foliage plants, in addition to having handsome flowers. Those of *Margaritæ* are banded in this way, and rose coloured beneath. *Macedoiana* is similar, but violet beneath; while *medio-aurata* has a median yellow band.

Propagation.—By seeds in heat in February or March. Short lateral shoots taken off in spring and inserted in pots of sand plunged in bottom heat, or placed in a propagating case, make sturdy dwarf plants to flower in autumn or winter.

Soil.—Fibrous or turfy loam broken into small pieces by hand, and mixed with an equal quantity of fibrous peat, with a liberal use of sharp sand.

Other Cultural Points.—During summer the plants should be liberally supplied with water when making their growth, and an even temperature maintained to avoid giving them a check, which causes some of them to drop their leaves. Good drainage is necessary. Keep them drier and cooler in winter. *Cristata*, and possibly others, flower well when planted out in the borders of a stove, well exposed to light.

Principal Species :—

aurantiaca, 3', Dec., or. sc. The most popular and most frequently cultivated species.

— *Roetzlii*, 6" to 9" when grown from cuttings annually, Dec., or. sc.

chamissoniana, 1', Nov., yel. Leaves banded and spotted wh. (*syn.* *punctata*).

fascinator, 1½', Sep., Oct., sc. Dwarf and pretty-fulgens, 1½', Sep. to Nov., or. sc. Of easy culture.

Margaritæ, 1½', or. Handsome banded leaves.

tetragona, 2', Sep. to Nov., sc. (*syn.* *cristata*).

Other Species :—

atrovirens, 1', yel. *ornata*, 1', yel. pur.

glabrata, 1½', Oct., Nov., *squarrosa citrina*, 1', yel.

liboniana, 1', cr. yel. — *Leopoldii*, 1', citron yel.

macedoiana, 1'. *sulphurea*, 1', yel.

medio-aurata, 1' (*syn.* *tetragona grandis*, 2',
Graptophyllum medio-auratum). *imperialis*, 2', Sep., red.
variegata, 1½', yel.

APHELEXIS.

Description.—Evergreen shrubs (*ord.* Compositæ) from the Cape of Good Hope, and requiring treatment similar to that of Heaths. They are closely allied to *Helichrysium*, but are referred to here for garden purposes. The stems are woody and stiff, while the leaves are also of the same dry, rigid texture. Their ornamental character is chiefly due to the dry, coloured bracts surrounding the heads of flowers. The genus is referred to *Helichrysium* by Benthams and Hooker.

Propagation.—By cuttings of the young wood, just getting matured, in sand and peat, inserted firmly in pots and placed under a bell-glass, to be frequently wiped dry to prevent the damping of the cuttings.

Soil.—Fibrous mellow loam one part, peat three parts, with a liberal use of silver sand. Pot firmly.

Other Cultural Points.—In winter they require less moisture than in summer, but the soil must be kept just moist. If allowed to get dust dry it would cripple if not kill the plants. Temperature 40° to 45° in winter, 55° to 65° in summer.

Principal Species and Varieties :—

humilis, 2', My., Je., pk. (*syns.* *A. macrantha* and *Helichrysium humile*). For exhibition purposes this is the most popular, and used to be largely grown when grh. hard-wooded plants were more encouraged.

— *grandiflora*, ro. pur.

— *rosea*, 2', My., Je., ro.

— *purpurea*, 2', My., Je., pur. Heads large, plant dwarf.

macrantha (*see humilis*).

Other Species :—

<i>ericoides</i> , 1', Je., grh., wh.	<i>sesamoides rubra</i> , 2', Jy., red.
<i>sesamoides</i> , 2', My., pur., wh.	— <i>versicolor</i> , 2', Jy., variegated.
— <i>alba</i> , 2', Jy., wh.	

APHIDES.

Under this comprehensive heading is grouped a large family of destructive insects, of which there are nearly 200 species. All Aphides belong to the class known as "sucking" insects, owing to the injury they cause to plants by extracting the sap with the aid of a tubular beak, the amount of damage done being proportionate to the number of insects, and the time they are allowed to pursue their depredations unchecked. Certain species also discharge a sweet sticky secretion, called "honeydew," from the hinder extremity of the body, which is unsightly on plants, and prevents the leaves from performing their proper functions by sealing up the pores. Ants are very partial to this honeydew, and closely follow the insects in search of it.

Aphides are a source of continual annoyance to gardeners, as they attack many families of plants, both under glass and outdoors. Eradication is difficult, owing to the rapidity with which the insects reproduce their kind, and the trouble is greater in the case of certain species, which curl up the leaves of their food plants, and thus form a means of safe protection for themselves against both weather and insecticides. In addition to the true males and females, there is a race of wingless, asexual, viviparous individuals, which are produced from eggs that are deposited in the autumn, and, after lying dormant through the winter, are hatched out in the spring. These also reproduce their kind. The food plants of Aphides are of widely contrasted character, and many of the

species are named after the family on which they prey; but some insects have such omnivorous tastes that if one food plant fails they adapt themselves to another in the vicinity. They do not enjoy an undisturbed existence, however, for, apart from the efforts of gardeners to destroy them, the larvæ of the Ladybird (*Coccinella punctata*) are great destroyers of Aphids, and should be encouraged. Other natural foes are the Syrphus or bee-like fly, *Chrysopa perla* or golden-eyed fly, ants, caterpillars, and some of the Ichneumonidæ.

Promptitude is the great thing in destroying Aphides, taking steps to eradicate the pests as soon as their appearance is observed. For spraying and washing plants and trees outdoors there are numerous forms of insecticide that are fatal to Aphides, and to destroy the pests under glass there is nothing better than fumigation, using the various preparations for the purpose.

For general use where the parasites are accessible, the following simple mixture is effective: Boil 1 lb. of Quassia chips and 1 lb. of soft soap for three or four hours in 3 gal. of soft water. Strain the liquid, add another 3 gal. of water, and apply warm with a syringe or sprayer.

Tabulated below are the chief species, and remedies are given under the names of the plants and trees on which they feed.

Aphis Brassicæ (Cabbage Aphis), grn. (*see CABBAGE*).

A. Cerasi (Cherry Aphis), blk. (*see CHERRY*).

A. Coryli (Nut Aphis), pale grn. (*see NUT*).

A. Dahliz (Dahlia Aphis), amber coloured (*see DAHLIA*).

A. Fabæ (Bean Aphis), blk. (*see BROAD BEAN*).

A. Humuli (Hop Aphis), grn.

A. Ligustri (Privet Aphis), dark br.

A. Mali (Apple Aphis) (*see APPLE*).

A. Persicæ (Peach and Nectarine Aphis) (*see PEACH*).

A. Pruni (Plum Aphis), light grn. (*see PLUM*).

A. Pisi (Pea Aphis), grn. (*see PEA*).

A. Loniceræ (Woodbine Aphis), dingy grn.

A. Ribis (Currant Aphis) (*see RED CURRANT*).

A. Rapæ (Turnip Aphis) (*see TURNIP*).

A. Rosæ (Rose Aphis), grn. (*see ROSE*).

A. Raphani (Radish Aphis).

APHYLLANTHES.

A very pretty hardy herbaceous plant (*ord.* Liliacæ) of Rush-like habit, with green stems, rudimentary leaves, and terminal clusters of blue flowers. Requires a warm, dry situation in winter, and a reserve should be kept in a cold frame to preserve it in severe winters. Propagated by seeds sown in pots or boxes when ripe, and placed in a cold frame; also by division of the tufts in April. Sandy loam and peat, with a little leaf mould, suit.

Only Species :—

monspeliensis, 1', Je., hdy., bl.

APICRA.

Dwarf, slow-growing, and neat succulent plants (*ord.* Liliacæ) closely allied to the true Aloes and Haworthia, with green, white, straw coloured, or yellow flowers. They should be grown in pots in a dry and moderately warm greenhouse, with very little water in winter. They are of easy culture. Propagation is by suckers taken off with or without roots; also by cuttings kept just moist, but not over-watered, under a bell-glass. Fibrous, mellow loam, mixed with finely broken soft red bricks or potsherds, and sand, suit.

Principal Species :—

aspera, 1', Je., grey or straw coloured. Dwarf.
— *major*, 1' Je., grey or straw coloured. Stronger.
pentagona, 1' 9", Je., grey (*syn.* *Haworthia pentagona*).

— *bullulata*, 1½', My., yel. (*syn.* *Aloe bullulata*).
Leaves warted.
— *spirella*, 1½', Je., grey.
— *Willdenovii*, 6", Je., pale grn. (*syn.* *spiralis*, of Willdenow).
spiralis, 1', Je., grey (*syn.* *imbricata*).

Other Species :—

asperula (*see* *Haworthia asperula*).
bicarinata, 1', Je., grey.
congesta, 1' Je., nearly wh.
deltoides, 1', My., nearly wh.
foliolosa, 1', Jy., grey.
nigra (*see* *Haworthia nigra*).
rigida (*see* *Haworthia subrigida*).

APIOS. (GROUND NUT.)

A genus of four twining perennials (*ord.* Leguminosæ), only one of which is in commerce. They have tuberous roots and purplish flowers. Increased by division of the tuberous roots. A light, warm soil and a sunny sheltered position, with a trellis or shrub to climb over, are the principal requirements of the Apios. Plant the tubers in spring and mulch in winter.

Principal Species :—

tuberosa, climbing, Jy., etc., hdy., br. pur. A graceful twiner with Pea-shaped flowers. In its native habitats in Canada and the United States it grows in moist soil (*syns.* *Glycine Apios*, *Apios Apios*).

APIUM.

Biennial hardy herbs, or perennials (*ord.* Umbelliferæ) of no horticultural value except in the case of Celery, which see.

Principal Species :—

chilense, 1', Jy., wh.
graveolens, 3' to 4', Jy., bien., wh. The garden Celery.

— *rapaceum*, *Celeriac*.
— *tricolor*, 3', Jy., bien., wh. The leaves have silvery grey ribs, wh. margins.

APLECTRUM.

A terrestrial Orchid (*ord.* Orchidacææ) having a tuberous rootstock, and succeeding in the open air in this country if planted in shady spots in suitable soil, as in the case of *Trillium*. Propagation is by offsets from established clumps. A compost consisting chiefly of peat, leaf soil and sand should be prepared to replace the natural soil in shady situations.

Principal Species :—

hyemale, 1' hdy., greyish br.

APOCYNUM. (DOG'S BANE.)

Hardy herbaceous plants (*ord.* Apocynacææ) of easy culture, with numerous small flowers. Propagated by seeds. Or division of the clumps in March or April, when growth is commencing, will readily give all the stock required. Any well-drained garden soil will suit.

Principal Species :—

androsæmifolium, 2', Jy., frutescens (*see* *Ichnocarpus*).
Aug., pale red with darker lines.
cannabinum, 3', Aug., yel. *hypericifolium*, 2', Je., wh.
venetum, 2', Je., wh.

APODOLIRION.

A genus of six species of bulbs, including *Gethyllis lanceolata*, allied to *Cooperia*, and belonging to the order Amaryllidææ. Leaves linear

like those of a *Crocus*, as is the white, reddish, or rose flower which nestles among the leaves. They are propagated by offsets, and require greenhouse treatment in a compost of light sandy loam and peat. Keep them dry while resting in winter.

Principal Species :—

Etræ, 4' to 6", wh., ro.
lanceolatum, 6" to 8", Jy, grh., wh.

APONOGETON.

Interesting and beautiful stove or hardy aquatic plants (*ord.* Naiadacææ) worthy of increased cultivation. Increased by division or seeds. Loam, leaf soil, and a little gritty sand, suit them. The tender species thrive in small tanks under glass, where a winter temperature of 60° to 65° is maintained, rising in summer to about 10° more. The hardy species can be grown in ponds, small tanks, and tubs in the open air. The latter increase very rapidly, and require occasional division to prevent overcrowding. A depth of water of from 1' to 1½' is most suitable.

Principal Species :—

angustifolium, pk., bracts wh. A grh. plant of considerable beauty.

distachyon, Je., etc., wh. The Cape Pond Weed, or Water Hawthorn. A charming hdy. aquatic with a delicious fragrance. There are several varieties, few being as hdy. as the type. The variety *monostachyon*, formerly considered a separate species, requires a st. temperature. Sep., pk.

— *Legrangei*, wh., ro. bracts.

— *roseum*, ro.

fenestrale, Aug., grn. The Lattice or Lace-leaf Plant. Its beauty consists in the lace-like leaves, which are much admired (*syn.* *Ouvirandra fenestralis*).

spathaceum junceum, half-hdy., blush.

Other Species :—

bernerianum, Aug., st., pk. *crispum*, Aug., st., wh.

APPENDICULA (*syns.* *CONCHOCYLUS* and *METACHILUM*).

Epiphytal Orchids (*ord.* Orchidacææ) with leafy stems, often compressed, or two-edged, and bearing short racemes of small or minute flowers in the axils of the leaves, and often towards the apex of the stems. They are propagated by division or by offsets. For compost use fibrous peat and chopped sphagnum with plenty of drainage. Grow them in the East Indian house.

Principal Species :—

peyeriana, 1' to 1' 6", st., wh.

APPLE.

Description.—One of the most useful and profitable hardy fruits (*ord.* Rosacææ). In the form of the Crab it grows wild in Britain, but it is generally supposed that the race of varieties grown in this country was introduced, at different times, from the continent.

Propagation.—By seeds, cuttings, and layers; also by budding and grafting on various stocks. For commercial purposes the last two are the methods generally adopted.

Stocks.—There are several different stocks used, and the best for dwarf trees which are desired to come quickly into bearing is the broad-leaved English Paradise, a dwarf variety of *Pyrus Malus* of bushy habit, producing masses of fibrous roots near to the surface of the ground. The stocks are chiefly obtained by layering and pegging down the

Apurum (*see* *Dendrobium*).

shoots. "Free" stocks are obtained by sowing the seeds of Apples, and are mostly used for standard trees. The Crab stock obtained from seeds of the wild Crab is suitable for standard and permanent orchard trees. The kind of stock used has a great effect on the character and longevity of the trees. Apples worked on a dwarf stock are quicker in coming into bearing, and more suitable for garden culture, than those worked on Crab and free stocks; but they have not the same vigour or lasting power.

Budding.—This method is generally practised for raising trees. Dwarf trees are worked close to the ground, and standards and half-standards a few inches above. The operation is quicker than grafting, and is performed in July and August. (For mode of procedure, see BUDDING.)

Grafting.—The process called whip grafting is the best for raising young trees. The scions should be selected from vigorous trees in February, and be laid in the ground till the sap has risen in the stocks in April, when they may be worked. But grafting is a useful means of renovating old, and changing the character of unsuitable, trees. Inferior varieties and undesirable specimens of established trees should be headed back late in winter, and be grafted with the sort required in the spring either by the "crown" or "cleft" process. If properly done, growth will be vigorous, and in a few years' time the old tree will be furnished with a new head (see GRAFTING).

Forms of Trees.—Standard trees have clean stems 5' or 6' from the ground, and are suitable for permanent orchards. Half-standards have shorter stems, and are adapted for gardens, and market plantations. Feathered standards are furnished with heads, but they are worked close to the ground, and have fruit spurs on the stems. Bush trees are worked near the ground, and are suitable for gardens and plantations. Pyramids are worked low, and have an erect stem with branches radiating all round. Espaliers are suitable for growing on walls and fences. They have perpendicular stems with side branches in tiers at right angles. There are several other ways of training wall trees. Perpendicular single cordons are trees with single fruiting stems. They are excellent for growing about 2' apart on walls and fences provided for their support in the garden when a number of varieties are required in a small space. Horizontal single cordons have one stem, trained horizontally, and are useful for growing by the sides of walks in kitchen gardens, about 2' from the ground.

Soil.—The best soil for Apples is a rich, deep, and well-drained loam. South or south-west is a good aspect. Soil and situation have a great effect on Apples, and where these are unfavourable hardy and vigorous sorts should be grown. Shallow mediums, with cold, wet subsoils, are unsuitable, and are conducive to canker. Low situations should be avoided, and land holding stagnant moisture requires draining before planting.

Planting.—November and December are the best months for planting. Standards for permanent orchards should be placed 30' apart, and they succeed best if the ground is under cultivation for a few years before being laid down to grass. Failing this a few yards round the stem of the trees should be kept clear of turf until the specimens are established. If the soil is fairly rich no manure is required when planting, otherwise a little decayed material may be mixed with

the compost placed above the roots. Prepare wide stations, shorten back long and jagged roots, spread out the fibres evenly, and cover with a few inches of soil. Stake the trees to keep them in position, and place a mulch of manure on the surface. In wet soils it is better to plant on the surface and make a mound over the roots of the trees. Bush trees on dwarfing stocks may be placed 12' apart to form plantations. The same distance is suitable for pyramids.

Pruning (Branch).—The objects of pruning are to form shapely trees and to enable them to continue bearing. In using the knife the operator



SUMMER PRUNING APPLES.

E Leading growths of bush and pyramid tree; **s**, leader; **t**, point of stopping; **u**, continuation growth stopped to three leaves; **w**, sub-continuation growth; **w**, laterals pinched to one leaf; **x**, side shoots pinched at about 6" of growth to form stout side and subsidiary branches; **y**, short stubby shoot not to be stopped; **x**, terminal bud, plump and rounded—a blossom bud.

must be guided by the habit of the variety and character of the tree. In the case of standards and trees of unrestricted growth, the head must be kept open, congestion of growth avoided, and all shoots that rub and cross each other removed. Dwarf and pyramid trees that are furnished with a sufficient number of main branches may have their leading shoots of the current year's growth shortened back a little to induce the lower buds to break, and the side growths cut back to two buds for the formation of spurs. All side shoots of espaliers and cordons should be treated in the above manner, and the leading growths left three parts their original length for the purpose of extension. Summer pruning consists of shortening these side shoots to four or five leaves while growing, and cutting back to two buds in the winter. All leading shoots on standards, bushes, and pyramids should be cut to an outside bud to avoid overcrowding the centre of the tree.

Pruning (Root).—This operation becomes necessary when trees are making exuberant growth but producing no fruit. In the case of young specimens

it is better to lift them, shorten back the long, whip-like roots, and replant. Established trees should be operated on in the autumn. Make a trench round the tree level with the spread of branches and fork down the soil in the direction of the stem; cut back the strong roots, and drive the spade under the ball to sever tap roots that are working into the subsoil. Fill up the trench, and top-dress with spent manure to encourage fibrous roots near the surface. In the case of large trees the trench should be made only half-way round one year and completed the second.

Gathering.—When trees are carrying heavy crops it is advisable to remove a portion of the fruit when large enough to use, and leave the remainder to finish. That left will be larger, and there will be no undue tax on the energies of the tree. The fruits of early Apples which ripen on the tree should be picked off when they will leave the branch with a slight upward pressure of the hand. Late keepers should not be allowed to hang later than the end of October. Great care must be exercised in picking to avoid bruising the fruit. Store on shelves in a dry, frost-proof compartment, where an even temperature of about 40° can be maintained.

Manures.—Applications of manure should be governed by the condition of the trees. Old specimens are improved and young ones assisted by a coating of stable manure placed on the soil from the trunk to the spread of the branches. Mulchings are beneficial when trees are bearing fruit, and the size is increased by applications of liquid manure. Amongst concentrated manures bone meal is excellent for heavy soil, applying it in the winter or early spring at the rate of about 4 lb. per square rod, and lightly picking it in. A good mixture for a spring dressing is formed of 4 lb. superphosphate and 2 lb. kainit per square rod, hoed into the surface soil. In some instances muriate of potash is more beneficial than kainit. The application may be made as soon as the fruit is set, to assist in its development. Weakly growing trees are improved by a top-dressing of 1 lb. of nitrate of soda per rod, in addition to the above.

Principal Enemies.

American Blight (see AMERICAN BLIGHT).

Blossom Weevil (*Anthonomus Pomorum*).—This destructive beetle is very small, of a dark brown hue, and possesses a long beak, which is used for piercing the unexpanded buds of Apple and Pear blossoms. Early in the spring the male flits about among the trees in search of a mate, and as soon as the blossom bud swells the female commences to deposit her eggs. She makes a hole in the bud with her long beak, and in it deposits a single egg. The process is continued in other buds, and as one beetle lays a considerable number of eggs, she is the means of spoiling many flowers. As the blossom buds expand white grubs with black heads appear in the centre, and soon commence to eat the stamens, pistil, and petals of the flowers. When full fed the grubs assume the chrysalis state, and early in the summer beetles are again on the wing and feeding on the leaves. In the meantime the affected flower buds lose their freshness, and eventually wither. In the autumn the weevils leave their feeding ground to seek protection for the winter, and this they find in the crevices of rough bark, and under stones, leaves, and rubbish near the trees, where they remain till the early spring, when they emerge, and commence the work of perpetuation. By adopting a system of

summer pruning many of the weevils may be destroyed. Gather up dead leaves and litter from round the trees and burn them. Limewash the stems and lower branches. In bad cases spread tarred cloths under the trees in the spring, and shake the trees over them. This will dislodge the weevils.

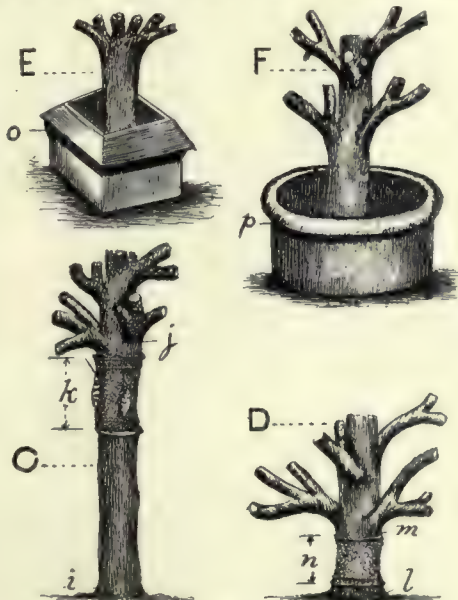
Canker (*Neotria ditissima*).—This dreaded fungus is the bane of Apple trees, and though all are liable, some varieties—notably, Ribston Pippin and Lord Suffield—are more susceptible than others. Its presence may be traced to various causes, amongst which are—wet, unsuitable and poverty-stricken soil, abrasions of bark through rubbing of branches, and other causes, and gaping wounds resulting from attacks of American Blight. Canker may often be prevented by planting suitable varieties on well-drained soil, feeding adequately and keeping down insects; but in very bad cases a cure is doubtful. When poverty is the prime cause of the trouble the tree should be encouraged to make free growth, and the following mixture has proved to be beneficial:—

12 lb. of superphosphate. 1 lb. of sulphate of iron.
10 lb. of nitrate of potash. 4 lb. of sulphate of lime.
3 lb. of nitrate of soda.

Apply in January or February at the rate of 4 oz. per square yard as far as the branches spread.

In its early stages the fungus may be checked by scraping the diseased parts with a knife, and dressing with Stockholm tar.

Codlin Moth (*Carpocapsa pomonella*).—This is one of the worst of Apple pests, and the moth, which is on the wing in the late spring, deposits eggs singly in the calyx end of the fruit, and



GREASE-BANDING FOR WINTER MOTH.

- C Single sticky band on half-standard tree stem: *i*, collar of tree; *j*, junction of branches with stem; *k*, sticky band.
D Simple sticky band on bush or pyramid tree: *l*, butt of stem; *m*, base of head; *n*, sticky band.
E Square United States moth guard of wood or of tin, made in two parts: *o*, smear of cart grease.
F Tin guard with rim turned down outside: *p*, smear of cart grease.

fastens them by means of a gummy secretion. In a short time the larvæ appear, and pierce the young fruit, eventually causing the Apples to fall. In the pupa state they pass the winter under loose bark on the stems and in adjacent heaps of rubbish. Pick all fallen fruit from the ground. Remove and burn loose bark in the winter. Limewash the stems of the trees. Spray the trees with Paris Green as soon as the fruit is set. To prepare the latter mix 1 oz. of Paris Green (Blundell's paste) thoroughly in 20 gallons of water.

Lackey Moth (*Bombyx neustria*).—This moth, which is on the wing in July and August, deposits eggs in rings round the shoots, and fastens them with a waxy substance. The caterpillars live in webs spun round the ends of the shoots, and after devouring the foliage the colonies break up, and the caterpillars seek a fitting place wherein to pass the final stage. They may often be seen letting themselves down by slender threads. Cut off the twigs containing eggs in the winter and early spring. Cut out the colonies of caterpillars, and drop them in a pail of hot water.

Lichen and Moss.—These parasites cause injury by choking up the pores of the bark, and also by harbouring insect pests. Limewash the stems and lower branches in the winter, or spray with a caustic solution formed of 1 lb. of caustic soda (Greenbank's 98%) and 1 lb. of pearlash dissolved in 10 gallons of water. When using this solution gloves should be worn, as it is injurious to the skin.

Mussel Scale (*Mytilaspis Pomorum*).—The "scales" which may be seen on branches of Apple trees are not the insects, but a covering for the eggs. Bad attacks are injurious, and should be got rid of as early as possible. Remove the scales with a stiff brush. Brush the affected branches with a strong mixture of Gishurst Compound or other approved insecticide.

Small Ermine Moth (*Hyponomeuta Padellus*).—This is a common native moth, which deposits eggs on the branches of Apple trees, and secures them with a gummy secretion. The larvæ appear in the spring, feed on the young leaves, and locate themselves in web colonies among the foliage. The same remedies as for Lackey Moth may be applied, syringing also with paraffin emulsion.

Winter Moth (*Cheimatobia brunata*).—The Winter Moth is so called because it is on the wing in November and December. The males can fly, but the females are only furnished with rudimentary wings, and have to ascend the trunk of the tree in order to deposit eggs. The latter are laid during the winter, and the larvæ appear in the spring, when they at once begin to feed on the young shoots. When full fed the caterpillars lower themselves by means of fine threads, and become pupæ just beneath the soil. Fasten bands of grease-proof paper, smeared with cart grease, round the stems of standard trees to trap the females as they ascend the trees. These should be put in position early in November, and be kept sticky through the winter by repeated dressings of grease. Spray the trees in April, and again, if necessary, before flowering commences, with Paris Green. Where poultry have the run of plantations they will devour caterpillars shaken from dwarf trees by giving the branches a sharp jar.

Selections of Varieties for Dessert :—

Varieties ripening in July and August.

Beauty of Bath.	Irish Peach.	Red Juneating.
Devonshire Quar-	Mr. Gladstone.	Rivers's Peach.
renden.		

September and October.

American Mother.	Red Astrachan.	Summer Golden
Kerry Pippin.	St. Edmund's	Pippin.
Lady Sudeley.	Pippin.	Worcester Pear-
		main.
Allington Pippin.	Christmas Pear-	King of the Pipp-
Baumann's Rein-	main.	pins.
ette.	Cox's	Orange
Blenheim Orange.	Pippin.	Margil.
Cockle's Pippin.	Hornhead Pear-	Ribston Pippin.
	main.	Scarlet Nonpareil.
		Sturmer Pippin.



APPLE ST. EDMUND'S PIPPIN.

Selections of Varieties for Cooking :—

August and September.

Duchess of Olden-	Lord Grosvenor.	Manks Codlin.
burg.	Lord Suffield.	Potts's Seedling.
Early Rivers.		

October.

Cellini.	Ecklinville Seed-	Golden Spire.
Cox's Pomona.	ling.	Stirling Castle.
	Grenadier.	The Queen.

For Keeping.

Alfriston.	Lane's Prince	Striped Beefing.
Annie Elizabeth.	Albert.	Tower of Glammis.
Bismarck.	Lord Derby.	Waltham Abbey
Bramley's Seed-	New Northern	Seedling.
ling.	Greening.	Warner's King.
Gascoyne's Scar-	Newton Wonder.	Wellington (Nor-
let.	Peasgood's None-	mantou Wonder,
Gloria Mundi.	such.	Dumelow's Seed-
Golden Noble.	Sandringham.	ling).

Twelve Good Varieties for Orchard Planting.

Alfriston.	Cellini.	Newton Wonder.
Annie Elizabeth.	Gascoyne's Scar-	Waltham Abbey
Bismarck.	let.	Seedling.
Blenheim Orange.	Lane's Prince	Warner's King.
Bramley's Seedling.	Albert.	Wellington.



APPLE THE QUEEN.

Twelve Good Varieties for Bushes, Pyramids, or Cordons.

Cox's Orange	King of the	Potts's Seedling.
Pippin.	Pippins.	Sturmer Pippin.

Duchess of Olden- burg.	Lord Grosvenor. Lane's Prince Albert.	Stirling Castle. Scarlet Nonpareil. Worcester Pear- main.
Ecklinville Seed- ling.	Peasgood's None- such.	

Six Good Varieties for Heavy Soil.

Bramley's Seed- ling.	King of the Pippins.	Sturmer Pippin. Wellington.
Duchess of Olden- burg.	Newton Wonder.	

APRICOT.

Description.—A highly prized stone fruit (*ord.* Rosaceæ), grown chiefly on walls and in orchard houses. Apricots are much affected by soil and climatic conditions, succeeding well in some districts, chiefly in the South of England, but difficult to grow in other parts.

Propagation.—From seeds and by budding, the latter being the better method. Seeds may be sown in August and September outdoors in light soil, and covered 2" deep. Lift and transplant at the end of the first year. Seedling Apricots make good stocks on which to bud other varieties. Other stocks are the Mussel and St. Julien Plum. Budding should be done in June (*see* Budding).

Soil.—Deep, fertile loam is the best, and it is important that the drainage should be good. Apricots like lime, and where the soil is not well supplied with it chalk and old plaster should be dug in before planting. This is better than making borders very rich with manure.

Aspect.—Southern and western aspects are the best, and low situations should be avoided, as the blossoms are liable to be affected by frost. The trees should be protected while in bloom with fish netting suspended over them. It is a mistake to plant on aspects exposed to cold winds.

Planting.—When selecting trees avoid any on which a gummy exudation is observed on the stem. Trained trees of three years' growth are the most suitable. Early in November is the best time for planting. Prepare wide stations, spread the roots out, and cover with 3" or 4" of soil.

Training.—The foundation of wall trees having been laid when they were planted, the training consists of laying in leading shoots for extension, and side growths where there is room for them between the main branches.

Pruning.—Summer pruning consists of going over the trees in May or June, laying in growths of moderate strength to form permanent shoots where necessary, and pinching back the remaining side growths to three or four leaves to form spurs. When these shoots break they should be pinched back later to two leaves. If summer pinching is properly carried out, not much knife work is necessary in the winter. It consists of removing naked branches where younger and better growths can be laid in, and cutting back "foreright" shoots, or those which stand out from the front of the branches, to within a couple of buds from the base. Retain short, lateral spurs, as they produce bloom buds at the base. Lay in leading shoots for extension, but if these are vigorous, shorten them back by one-third their length to encourage the lower buds to break.

Other Cultural Points.—The great trouble with Apricots, particularly the well-known variety Moorpark, is caused by branches dying off suddenly, completely spoiling fine specimens that have taken years to grow. Sufficient growth should be laid in to fill up gaps when branches die away. Gummying is a serious trouble, and may often be traced to

bad unions with the stock and abrasions in the bark. There is no remedy beyond the removal of badly gummed branches. When trees are bearing, mulchings of manure are beneficial, and applications of liquid manure assist the fruits to swell. Overcropping is a great strain on the energies of the trees, and should be avoided. Thin out the fruits early in June to 4" or 6" apart; the trees are benefited, and the size of the individual fruits is increased. Allow the fruit to hang on the trees till quite ripe before gathering.

Enemies :—

Aphides.—For remedies, *see* APHIDES.

Earwigs.—This pest commits its ravages at night, and may be caught by setting traps of inverted flower pots filled with dry hay near the trees.

Flies and Wasps.—Ripe fruits suffer through the attacks of these foes. Close netting suspended in front of the trees keeps them off, and in the case of the latter, nests should be searched for and destroyed.

Mildew.—Trees frequently suffer from this



SUMMER PRUNING APRICOTS.

E Central growths of pyramid : *a*, leading shoot or continuation of stem; *j*, point of first stopping, at 1' of growth or thereabouts; *j*, second growth from leader pinched at third leaf; *h*, third stopped growth; *i*, continuation growth; *m*, laterals pinched to one leaf as made; *n*, side shoots to form branches stopped at about 6" of growth; and laterals and sub-laterals to one leaf as formed.

fungus when there is an excess of moisture at the roots. Draining the border, and mixing lime rubble with the soil, are good preventives, and dusting the affected leaves with flowers of sulphur is an excellent cure.

A Selection of Varieties.

The following is a selection in order of ripening:—

Oullin's Early	Hemskirk.	Grosse Pêche.
Peach.	Moor Park.	Powell's Late.
Large Early.	St. Ambrose.	
Breda.	Royal.	

The first four are early varieties, the next three mid-season, and the other two late.

AQUATICS.

The cultivation of aquatic plants, which languished for some time, has lately received an impetus through the introduction of M. Latour-Marliac's new hybrid *Nymphæas*. These have not only almost revolutionised the prospects of water-gardening out of doors, but they have also led to an increased interest in the genera and species of aquatic plants which require the protection of glass; and in consequence there is a prospect of these plants becoming more sought after. That

sions may be made of clay or concrete, or a combination of both. The clay must be thoroughly puddled, and made quite impervious to water. It may be about 6" thick where there is a retentive subsoil, but 2" more if it is porous. Where expense is of little consequence, concrete is to be preferred. The concrete must be thoroughly mixed, and should be not less than 3" thick, and finished off with a thin coating of cement and sand in equal proportions. It is essential that the soil beneath should be made very firm, so as to prevent subsidence.



Photo: W. Rosster, Bath.

AQUATICS AT HOME.

they are worthy of it may be seen by a visit to Kew or any other large botanic garden, or to one of the growing number of private gardens in which aquatics receive a due share of attention. The pen cannot do justice to the beauty of the hardy and tropical Water Lilies, or the many other plants which can be seen in these establishments.

Depth of Water.—The cultivation of the hardy aquatics is very simple. The depth of water required is not great, as most will flourish better in a pond or tank with from 1½' to 3' of water than in one of greater depth. Those who have in their grounds a lake or pond of natural formation will find little difficulty in making it a delightful feature by the introduction of the best aquatic plants. It is essential that any natural weeds which may occupy it should be carefully cleared out. The common Pond Weed, *Potamogeton*, is one of the worst of these, and every root ought to be taken out, or it will cause much after trouble. The pretty little Water Crowfoot is another troublesome weed. Should the centre of the lake be too deep in its entirety for aquatics, the margin alone may be occupied.

Making a Pond.—Where natural water is not available a pond or tank of any required dimen-

Tanks.—Useful tanks are also made of brick or stone set in cement. These are often too formal in outline for the garden. Some have the tanks elevated above the surface, but they look more natural if the water level is below the ground surface. It is desirable that a formal-shaped tank should be avoided; one of a perfectly circular, oval, or square form being too stiff to accord with the plants. The masonry or concrete at the margin ought also to be concealed from view by rockwork or soil, and planted with bog plants.

Situation and Planting.—The situation of the pond is a matter of much importance. It should be in as sunny a position as possible, and sheltered from cold winds. Much of the success depends upon the influence of the sun's heat upon the water. In planting the aquatics it is desirable to form a division for each plant, so that each may be kept by itself. This must not rise to the surface; it will be found of much advantage when the time comes for the cleaning out which is necessary at intervals.

Soil.—The greater number of aquatics like a rather rich and heavy soil. A good loam, inclining to heaviness, with a proportion of old cow manure, makes a good compost. Should the plants require to be placed in position when the pond is full, they can be put into small, flat

Apteranthes (see *Boucerosia*).

baskets, filled with soil, and weighted with stones, which can be sunk in the water. April is a good time to plant hardy aquatics, but they may be left as late as July or August if an earlier season is inconvenient.

The Water Supply.—The question of the water supply is of the highest importance. Few aquatics like or require a constant flow of water, and a running stream is unsuited for such things as *Nymphaeas*, although a small bay, out of the current, might be formed at the side for them. A sufficient flow to keep the water pure is desirable, but it has been found that a small tank will do without an outlet if a supply is at hand to fill up the loss from evaporation. A week or so after filling the water becomes clear and the plants grow perfectly. When the plants become overcrowded they must be lifted, thinned, and replaced.

The principal enemies of aquatics in ponds are voles, water-fowl, and water-snails. The first must be trapped, the second discouraged from coming near, and the snails kept down by the introduction of a few gold or other fish.

Culture in Tubs.—By way of a makeshift, and where a proper tank cannot be made, *Nymphaeas* and other hardy aquatics may be grown in tubs 3' or more across. The best Water Lilies for this purpose are the forms of *N. pygmaea* and of *N. Laydekeri*. A list of hardy water-plants is appended to this article, together with the names of suitable plants for the margins of lakes, ponds, or tanks.

Indoor aquatics are more under the control of

the cultivator, and even hardy species will often give better results than outside. Apart from those requiring a high temperature, the *Nelumbiums* and the new reputedly hardy *Victoria Trickeri* are only really satisfactory when grown under glass in most parts of the kingdom. For these, and for such *Nymphaeas* as *stellata*, very little artificial heat is required in summer.

Indoor Tanks.—The construction of a tank indoors must be carefully done, and a good foundation secured. The masonry requires to be about 1' in thickness for all but very small tanks, and laid in cement, the bottom having also 2" or more of good concrete. For convenience it is well to have the plants in tubs, filled with a similar compost to that used for the hardy plants, and the tank should be sufficiently deep to ensure from 1½' to 2' of water being above the crowns. Sufficient piping, 4" in diameter, should be in the tank to ensure a water temperature of nearly 65° minimum in spring and summer, never falling below 55°, even in the depth of winter. The temperature of the house should never fall below 60°, one rather higher at the minimum being even better. In suitable weather ventilation must be given, and a dry atmosphere avoided by the use of water on the paths and a liberal syringing of the plants. Even the hardy species outside are much benefited by syringing the leaves.

Propagation.—Aquatics are generally propagated by division, for which the best time is early spring. Many, however, are raised from seeds, which should be sown in pots and sunk in shallow water. The



HOW AQUATICS ARE GROWN AT MR. LEOPOLD DE ROTHSCHILD'S, GUNNERSBURY HOUSE, ACTON.

young plants must be transplanted, when large enough, into separate pots, and grown on until large enough for deeper water.

A Selection.—Hardy aquatics suitable for outdoor cultivation, or for a tank in a cold house, or one with a little heat:—

Nymphaeas in great variety, including the several hardy species and the hybrids from France and America. These will be found under the title of the plant in subsequent pages. *Nuphar luteum*; *N. advena*, *N. minimum*; *Alisma Plantago*; *Aponogeton distachyon*; *Hottonia palustris*; *Linnanthemum nymphaeoides*; *L. peltatum*; *Orontium aquaticum*; *Stratiotes aloides*; *Utricularia vulgaris*; *Azolla caroliniana*. The curious *Trapa natans*, like the last named, has floating leaves; it is not quite hardy, but can be kept in a tub in the greenhouse in winter.

Of those of a non-floating character there are *Acorus Calamus*, *A. gramineus*; *Alisma Plantago*; *Butomus umbellatus*; *Calla palustris*; *Iris Pseudacorus*, *I. laevigata*, *I. aurea*, etc.; *Menyanthes trifoliata*; *Peltandra virginica*; *Pontederia cordata*; *Ranunculus Lingua major*; *Sagittaria sagittifolia*, *S. s. fl. pl.*, and others; and *Typhas*. *Richardia africana* does in mild localities.

For the margin in moist soil there are many plants: *Acorus*, *Arundo*, *Bambusa*, *Caltha*, *Cardamine pratensis fl. pl.*, *Cyperus longus*, *Gunnera*, *Habenarias*, *Parnassias*, *Phormiums*, *Primula rosea*, *Scirpus*, *Spiraeas*, and many others.

Aquatics requiring heat comprise such as *Aponogeton fenestrale* and others of the genus, *Cyperus*, *Eichorneas*, *Jussiaea grandiflora*, *Linnanthemum indicum*, *Nelumbiums*, the beautiful tropical *Nymphaeas*, *Salvinia natans*, *Thalia dealbata*, and many more.

AQUILARIA.

Two or three trees (*ord.* Thymelæaceæ) requiring moist stove treatment. The Eagle-wood of the natives is the heart-wood of *malaccensis*. Flowers greenish white. Propagation is by imported seeds, also by cuttings in sandy soil in a propagating case with plenty of bottom heat. Fibrous loam, with a third part of peat, and plenty of sand to ensure porosity, suits.

Principal Species:—

malaccensis, 6' to 12' (*syn. ovata*).

AQUILEGIA. (COLUMBINE.)

Description.—One of the most elegant of border flowers (*ord.* Ranunculaceæ), producing graceful, long-spurred flowers on stems rising well above the beautifully-divided leaves. The greater number are hardy, though some, such as *cærulea*, are not easily grown in every garden. They are very ornamental in beds, borders, and rockeries, and the newer hybrids make fine pot plants. The long spurred hybrids of *cærulea* and *chrysantha* are very handsome, though not so long lived as *vulgaris*, our common Columbine.

Propagation.—By division or seeds, the latter sometimes germinating very irregularly. Sow under glass as soon as possible after it is ripe.

Soil.—The choicer species like a soil of sandy loam and leaf mould, but the more robust will grow in any common soil.

Other Cultural Points.—While the Columbines like moisture, the position in which they are grown should be properly drained and sunny. They cross freely, and isolation or protection with muslin is necessary if it is intended to keep the offspring pure.

Principal Species:—

alpina, 1', My., bl. A beautiful plant with large flowers, sometimes both bl. and wh. Rock garden. *cærulea*, 1½', My., etc., bl., wh. A lovely plant with large flowers having long, slender spurs which are tipped with grn. (*syns.* *leptoceras* and *macrantha*).

cærulea hybrida. The hybrids of *cærulea*, *chrysantha*, etc., are among the most charming of all Columbines, with their long spurs and varied colours, red, bl., yel., and wh. being represented.

canadensis, 2', My., etc., so., yel. A pretty, free-blooming plant of good colour and habit.

chrysantha, 3½', My., etc., yel. A great garden favourite, though not long-lived in many gardens.

einseliana, 2½', My., bl. Best known by its var. *thalictrifolia*.

formosa, 3', sum., red, yel. A fine border plant with rather short spurs (*syns.* *arctica* and *californica*). There are a few varieties.

glandulosa, 1', Je., lil., bl., wh. This is a short-lived plant which should be regularly raised from seed to replace the plants lost. It varies in height and a little in shade. Bicolor, *jucunda*, *longicalcarata*, *parviflora*, and *unicolor* are good varieties.

olympica, My., light bl., wh. A nice species, of which there is a double form.

pyrenaica, 6" to 1', lil. bl. A charming little Alpine species, with flowers large compared with the size of the plant.

sibirica, 1', sum., pale bl. A neat rock plant (*syns.* *speciosa* and *garneriana*).

Skinneri, 2', Jy., etc., yel., grn., red. A pleasing species.

Stuarti, 9", Je., dark bl., wh. A lovely hybrid between *glandulosa* and *vulgaris wittmanniana*. Should be treated as a bien. in most gardens. Raised by Dr. Stuart, Chirside.

vulgaris, 3' and upwards, My., etc., various. An old, well-known garden plant with many varieties, single and double.

Other Species:—

Bertolonii, 1', *glauca*, 2', Je., *parviflora*, 1', Je., Jy., bl. bl. bl. *flabellata*, 1', *longissima*, 4', *viridiflora*, 1', My., Je., wh. Jy., yel. grn. *fragrans*, 6', *moorcroftiana*, 1', My., yel. My., bl., wh.

ARABIS. (WALL CRESS. ROCK CRESS.)

Description.—A large genus of plants (*Ord.* Cruciferae) of which a considerable number are of much value in the garden, although many are of a weedy and unornamental character. They are generally of a trailing or creeping habit, and are thus well suited for rockwork, edgings, or small flower beds. The flowers are in clusters. Some of the variegated-leaved varieties are greatly appreciated.

Propagation.—All the species may be propagated by division, or by cuttings taken off after flowering and put in light soil under a handlight or frame and shaded until rooted. All, except the variegated forms and the double flowered variety of *alpina*, are readily raised from seeds sown under glass or in the open in spring.

Soil.—Arabises, as a rule, prefer a light and rather dry soil. *Lucida* and its variegated form, however, like a strong and rather damp soil.

Other Cultural Points.—They look best on a rockery, or as an edging, and require little attention in the way of manure. It is desirable, if

compact plants of *alpina* or *albida* are required, to clip them back severely after blooming. They will soon sprout again.

Principal Species :—

albida, 9", Mch., etc., wh. A useful plant, closely resembling *alpina*, but having larger flowers, grey and less toothed leaves. There is a pretty variegated form. The new double var. will please everyone.



HOW TO PROPAGATE ARABIS (ROCK CRESS).

A Division of Variegated White Rock Cress (*Arabis albida* variegata): a, portion of old root stem with roots; b, young growths from base; c, crown; d, depth of inserting in soil.

B Double crown slip (a side growth slipped off close to stem): e, portion of rootstock; f, stem without roots; g, points of detaching for cuttings; h, depth of inserting slip in soil.

C Section of thumb pot (2½"): i, drainage; j, sandy soil; k, space for holding water; l, cuttings properly prepared and inserted (four in a pot).

D Rooted cutting in the autumn from pot, showing dwarf, compact, branching habit of plant; m, ball of soil; n, depth of planting.

E Slip of White Rock Cress (*Arabis albida*): o, base of slip; p, depth of inserting in soil.

F Division of White Rock Cress: r, portion of rootstock; s, depth of inserting in soil.

alpina, 6", Mch., etc., wh. Very like the preceding, but more compact.

arenosa, 6", My., ro. A pretty rockery plant.

blepharophylla, 5", Feb., pale pur. Rather tender for cold districts.

lucida, 6", Je., wh. The type is not worth growing when the variegated form can be got. It has pretty yel. and grn. leaves. It makes a handsome edging, but does better in cold than in warm districts.

procurrens, 8", Mch. to My., wh. A neat plant, surpassed in beauty by its prettily variegated form.

verna, 5", My., pur. The only good ann. species. It is effective in a mass.

Other Species and Varieties :—

bellidifolia, 9", My., wh. *japonica*, 9", My., wh.

bryoides, 2", Je., wh. *muralis*, 6", My., wh.

caerulea, 3", Ap., pale bl. *Stelleri*, 6", Je., wh.

Halleri, 8", Ap., ro., wh. *Sturii*, 9", My., wh.

ARACHIS.

Dwarf herbs (*ord.* Leguminosæ), in some cases prostrate, and numbering seven species, of which one (*hypogæa*) is grown in the economic stoves of botanical gardens in this country. It is grown in many tropical countries of the Old and New World for the sake of its edible seeds. After the flowering period the fruiting stalk lengthens to 2" or 3", and, gradually bending downwards, pushes the young pod into the ground, where it enlarges and ripens into a pale yellow, slightly curved, and

wrinkled pod containing two seeds as large as Peas. These pods are sent over to this country in large quantities under the name of Earth Nuts, Ground Nuts, or Monkey Nuts. Propagation is by seeds in a stove. Fibrous, mellow loam with a large percentage of sand suits.

Principal Species :—

hypogæa, 1', My., Je., yel.

ARACHNANTHE.

This genus contains two of the most remarkable species of Orchids (*ord.* Orchidaceæ) in cultivation, namely, *Cathcartii* and *Lowii*, the flowers being large and handsome. They are propagated by taking off the branches and rooting them. Use a compost of sphagnum, finely broken crocks, and charcoal over a considerable depth of clean crocks. Temperature in winter 55° to 60°; in summer not exceeding 75°.

Principal Species :—

Cathcartii, 3' to 4', Mch., Ap., yel., densely threaded with red br. and red lines. Requires a damp atmosphere at all times, and shade.

Clarkei, 1' to 1½', Sep., Oct., chest. br., barred yel. Likes more sunshine.

Lowii, 3' to 5', Sep., Oct., red or choc. br. with yel. blotches (*syn.* *Renanthera Lowii*).

— *Rohdeniana*, dwarfed, with smaller leaves than the type, and flowers brighter.

ARALIA.

Description.—A large genus of perennial herbs and shrubs (*ord.* Araliaceæ), the latter being the more numerous. All are valued for the sake of their ornamental foliage. The hardy herbaceous species may be grown in borders, or in beds of plants in the subtropical garden. The same applies to the few hardy shrubs, such as *chinensis* and *spinosa*. These have large and handsome leaves, prickly stalks and stems, and are majestic subjects either for the centre of subtropical beds or to fill large beds entirely with a groundwork of something beneath, as the leaves are confined to a tuft on the top forming the season's growth. They are deciduous. The others are stove or greenhouse shrubs, mostly the former, and make handsome table plants. The leaves in some species are simple, long and finger-like or strap-shaped; but a much greater number have palmate leaves, with three, five, nine, or a greater number of leaflets, the leaf in the latter case being almost circular in outline. Those enumerated below are shrubs, except where otherwise specified.

Propagation.—The hardy herbaceous species by division of the rootstock, keeping a bud to each piece. They are perfectly deciduous. The greenhouse and stove species by cuttings of the mature wood in sandy soil in a moderate bottom heat, or in a propagating case. *Veitchii* and its variety *gracillima* do not root readily by this process, but succeed well by grafting the tops on pieces of the roots of *reticulata* and some other species. *Chabrieri* (*Elæodendron orientale*) does not readily make good plants when side shoots are used as cuttings. Upright shoots from the top of plants that have been cut back for stock should therefore be used.

Soil.—Any good garden soil, if well drained, will meet the requirements of the hardy species. The stove and greenhouse species may be grown in good, fibrous loam, with half a part of leaf mould and sufficient sand to render it porous. A small

quantity of peat may be used for the more slender growing of the stove species.

Principal Species :—

Chabrieri (see *Elaeodendron orientale*).

chinensis, 5', hdy., wh. (*syn. canescens*).

— *foliis aureo-variegatis*; leaves variegated with yellow.

elegantissima, st., wh.; leaflets six or seven, and deeply toothed.

gracillima (see *Veitchii gracillima*).

Guilfoylei. A useful st. species with much divided leaves (now referred by botanists to *Panax fruticosum* var.).

japonica (see *Fatsia japonica*). A popular grh. and window plant, hdy. in the south.

kerchoveana, st. Similar to *elegantissima*, but has broader leaflets.

leptophylla (see *Dizygotheca leptophylla*). Leaflets slender, dark olive green.

papyrifera, st. (see *Fatsia papyrifera*). Handsome leaves for subtropical beds.

racemosa, 3' to 4', Jy., hdy., wh. Makes a fine bush for shrubberies.

reginæ, st. Has long, dark green leaflets, handsome (see *Dizygotheca reginæ*).

reticulata, st. A species with dark green strap-like leaves, with paler veins (see *Oreopanax*).

Sieboldii (see *Fatsia japonica*).

spinosa, 8', wh. Very handsome hdy. shrub for lawns.

Veitchii, st. Leaves palmate, olive green, with many leaflets.

— *gracillima*, st. Leaflets narrower, with white midribs (*syn. A. gracillima*).

Other Species :—

aculeata, grh., wh.

arborea, 15', st., green.

armata (see *Panax*).

capitata, 12', st., green.

cachemirica, 6', hdy.,

shr., wh. (*syn. macro-*

phylla).

coccinea (see *Leea*).

cochleata, st. (see *Panax*

cochleatum).

concinna, st. (*syns. spec-*

tabilis and *Delabra*

speciosa).

crassifolia, 10', grh., green.

(see *Pseudopanax crassi-*

folium).

— *picta*, grh., green.

deleauana.

digitata (see *Hepta-*

pleurum venulosum).

Duncani, st.

edulis, 5', hdy., green.

excelsa (see *Leea coccinea*).

ferruginea, 40', st., wh.

filicifolia, st.

fragens, st., wh.

Gemma, st.

Giesbreghtii (see *Mono-*

panax).

glomerulata (see *Brassai-*

opsis speciosa).

granatensis, st.

hispida, 8', Jy., hdy., wh.

(*syn. muehlenbergiana*).

longipes, st.

maculata, st.

Maximowiczii, hdy. (now

Acanthopanax ricini-

folium).

monstrosa,

nobilis, st.

osyana, st.

palmata, 10', st.

peltata, st.

pentaphylla (now *Acan-*

thopanax spinosum),

10', hdy., green.

— *variegata*, leaves edged

cream.

pubescens, 6', st., wh.

quercifolia, st.

quinquefolia (*Ginseng*).

— *gracilis*.

rotunda, st.

sambucifolia, 5', Aug.,

grh., wh.

Sciadophyllum (see *Scia-*

dophyllum Brownii).

Shepherdii, grh., green.

sonchifolia, st. (see *Meryta*

sonchifolia).

spectabilis (see *concinna*).

spinulosa, st.

ternata, st.

Thibautii (see *Oreopanax*).

trifolia (see *Pseudopanax*

crassifolium var.).

triloba, st.

umbraculifera, 40', st., wh.

(see *Polyscias nodosa*).

appearance. They are evergreen, and the spirally arranged leaves reach their maximum development in *imbricata*, as they adhere to the branches for twelve to fifteen years. This is the Monkey Puzzle or Chili Pine, and the only perfectly hardy species in the British Isles. *Cunninghamii* stands the winter in sheltered places near the sea on the south and west coasts, but never attains very handsome proportions. *Brasiliana* thrives best in a stove temperature, not necessarily very high, and *Rulei* is also generally accorded similar treatment, though both succeed in a warm greenhouse. The



Photo: Miss H. E. Smith, Hawerang.

ARAUCARIA IMBRICATA, AFTER A SNOWSTORM.

others may be grown in pots or tubs in the greenhouse, conservatory, or winter garden. In tall and roomy houses, kept cool and airy all the year round, there are no more handsome trees of this class than *excelsa* and *Bidwellii* for planting out, the former being notable for its spiry and graceful habit with horizontal branches, and the latter for the massive appearance of its dark green leaves and branches. While *Bidwellii* and *imbricata* have broad leaves, those of *excelsa*, *Rulei*, and others are awl-shaped, and not unlike those of *Cryptomeria japonica* or *Sequoia gigantea*. Normally the male and female flowers are on different trees, but occasionally both sexes occur on the same tree; *imbricata* occasionally bears both in this country.

Propagation.—Seeds are occasionally imported in greater or less quantity, particularly in the case of *imbricata*, and young trees are reared from them. More compact trees may be raised from cuttings inserted in sandy soil in a cool greenhouse, shaded from the sun till rooted. *Excelsa* is raised by thousands in this manner, both in this country and on the Continent. Side shoots rarely if ever make

ARAUCARIA.

Description.—A genus of interesting Coniferous trees (ord. Coniferae) of handsome and telling

good plants. The tops should be taken off those intended for stock plants, and rooted. The stumps will then throw up one or more leaders according to the strength or size of the trees so cut. These may be taken off and rooted, when the old plants will repeat the process.

Soil.—All the species thrive in good, friable, well-drained loam. Sand and leaf mould may be added for those grown in pots. If planted out in the beds of the cool conservatory or winter garden good turfy loam should be used to replace the natural soil, if in any way unsuitable. *Imbricata* will thrive for a time in almost any soil, but if the subsoil is sand or gravel the trees deteriorate as they get old. To sustain large trees the soil must be deep, rich, and well drained.

Principal Species :—

Bidwellii, 150', grh., grn. The Bunya-Bunya Pine.

excelsa, 120', grh., grn. (*syn.* *Altingia excelsa*). The Norfolk Island Pine.

— *glauca*, grh., glaucous.

— *goldiana*, grh., grn.

— *robusta*, grh., grn. A strong growing variety. *imbricata*, 50' to 100', rarely 150', Sep. to Nov., hdy., grn. The Monkey Puzzle or Chili Pine.

— *platifolia*. Leaves broader than in the type.

— *variegata*. Variegated.

Other Species :—

Balansæ, 130' to 160', grh., grn. *Cunninghamii*, 100', half-hdy., grn. (*syn.* *Altingia*). Moreton Bay Pine.

brasiliæna, 70' to 100', grh., grn.

— *gracilis*.

— *ridolfiana*.

Cookii, 200', grh., grn. (*syn.* *columnaris*).

— *glauca*, glaucous.

— *longifolia*, long leaved.

Muelleri, 50', grh., grn.

Rulei, 50', grh., grn. (*syn.* *Eutacta Rulei*).

— *elegans*.



Photo : E. Collins, Manchester.

ARAUCARIA EXCELSA IN A VASE.

ARAUJIA.

Description.—Twining evergreen shrubs (*ord.* *Asclepiadaceæ*). The genus includes the plants known in gardens under the name of *Physianthus* and *Schubertia*, the former having salver-shaped and the latter funnel-shaped flowers. A *sericifera* makes a very handsome climber for training up the rafters in greenhouses and conservatories where a temperature of 45° to 50° is maintained during the winter months. In warm districts it will thrive out of doors on a wall. The others require stove heat, and to be trained in the same way. Flowers white or purple.

Propagation.—By seeds in heat during spring. Short and firm side shoots, taken off in summer and inserted in sandy soil and plunged in gentle bottom heat, or put in a propagating case, root freely.

Soil.—Fibrous, mellow loam and peat in equal proportion, with plenty of sand to render it porous. Borders must be thoroughly well drained.

Principal Species :—

angustifolia, st., grh., wh., pur.

grandiflora, Oct., st., wh. (*syns.* *A. graveolens*, *Physianthus auricomis*, and *Schubertia grandiflora*). Flowers sweet scented.

sericifera, Aug., grh., wh. or pk. in bud (*syn.* *Physianthus albens*).

ARBORETUM.

A collection of hardy trees and shrubs planted for decoration or instruction; also the ground occupied by such a collection.

As a rule, the object most directly in view when making an arboretum is effect. Spring, summer, and autumn tints of flowers and foliage have all to be considered, and the planting must be arranged accordingly. Arrangement according to botanical classification is not advisable, for although this has its advantages it is much better left to the botanic garden. When scientifically constructed, and the trees properly attended to as they grow up, the arboretum is one of the chief sources of attraction in the pleasure grounds, and the fine collection of trees at the Duke of Northumberland's seat at Syon House, Brentford, and Captain Holford's at his Gloucestershire home, Westonbirt, Tetbury, show what can be accomplished in this direction.

ARBOR VITÆ.

Hardy evergreens, suitable for growing as individual specimens or for hedges. They are raised from seeds sown in spring, and from cuttings. They will succeed in almost any fairly good soil, and luxuriate in a strong loam. For species see *THUYA*. Perhaps the best known is the American (*Thuya occidentalis*).

ARBOUR.

A summerhouse, generally with open sides, or with lattice-work covered by climbing plants of various kinds. Nooks of this character are amongst the most pleasurable resorts in gardens, particularly when placed so that they command a view of some part of the flower beds or borders. As they are for summer use only they should be cool, and shaded from the sun. Arbours composed of rustic, unbarked wood are amongst the best, as the climbers take kindly to them. Iron structures are more permanent, and also much more expensive.

Amongst the climbers suitable for clothing the

roof and sides of an arbour are *Ampelopsis quinquefolia*, climbing Roses, especially Crimson Rambler and some of the charming multiflora varieties, Hops, both green and golden, *Tropæolum canariense* (Canary Creeper), *T. majus*, *Wistaria sinensis*, *Aristolochia Siphio*, and *Smilax aspera*. There is really no lack of material to assist those who wish to make an arbour.

ARBUTUS. (STRAWBERRY TREE.)

Very effective and ornamental evergreen shrubs and trees (*ord. Ericaceæ*) of great value for shrubberies and pleasure grounds. The greater number are hardy, and the fruit of some of the species adds much to their value as ornamental plants. Propagated by grafting, budding, inarching, or seeds, the last-named being preferable. Sow in March or April. A light, warm, and rather dry peaty or sandy soil is best. In exceptionally hard winters some are cut to the ground, so that a little protection is advisable in cold districts.

Principal Species and Varieties :—

Andrachne, 14', Ap., grn., wh. A pretty tree with leaves not unlike those of a Laurel (*syn. integrifolia*).

— *serratifolia*, 12', yel. (*see hybrida*).

Menziesii, 10', Sep., wh. Valuable for mild localities. Fruit or. red (*syns. procera* and *Andrachne* of gardens).

Unedo, 8' to 20', Sep., wh. A charming shr. with clusters of flowers, followed by sc. Strawberry-like fruit. Good vars. with pk. and red flowers are *coccinea* and *rubra*.

Other Species :—

hybrida, 10', Sep., wh.

ARCHES.

The value of arches in the flower garden is twofold. First they help to break up the monotony of what might otherwise be a flat surface, and thus do away with the appearance of dwarfness and stiffness. Then they afford congenial support to various climbing plants, which by their foliage or flowers, or both, add variety to the garden.

They may be constructed of wood or of iron. Rustic wood arches have an excellent effect when care is taken that they are not too heavy. The main posts should be stout, and, to minimise the effects of rot, it will be well to have the butts treated with creosote.

Iron arches are lighter in build, and although the plants do not take so kindly to them as they do to the wood, yet the difficulty is not a serious one.

In all cases arches should have their feet firmly bedded in the soil, for, with the plants they bear, they offer a considerable surface to the wind. The height of the arch from the ground, after it is fixed, should be at least 7'.

All the plants that are suitable for arbours will do upon arches, and, in addition, *Tecoma* (*Bignonia*) *radicans*, *Jasminum officinale*, *J. nudiflorum*, hardy Vines, and, in the south and south-west of England, *Solanum jasminoides*, *Passiflora cærulea*, and *P. c.* *Constance Elliot* may be named. This, however, does not by any means exhaust the list. Fruit trees, chiefly Apples and Pears, have been trained in this way.

Archangel (*see Angelica*).

Archangelica (*see Angelica*).

Archangel Mats (*see Mats*).



Photo : F. Weatherby. Southport.

ARCHES MADE ORNAMENTAL WITH FOLIAGE.

The most suitable position for arches is where they span broad grass or gravel walks, but it is easy to have too many of them, more especially in the case of small gardens. A pergola is really an extended series of connected arches. (See also PERGOLA).

ARCTOSTAPHYLOS.

Hardy or half-hardy shrubs (*ord.* Ericaceæ), removed from *Arbutus* by the five-celled fruits and the one-seeded cells. They are propagated by seeds, sown in sand and peat in a cold frame in March; by budding, and by inarching. For soil, take loam and peat in equal parts with sand; or peat and sand. No lime.

Principal Species :—

alpina, the Black Bearberry. A trailing, deciduous shr. Ap., wh. or pk. (*syn.* *Arbutus alpina*).

nevadensis, spr., flowers and fruit red.

nitida, 4', My., wh. Hlf-hdy. ev.

pungens, 1', Feb., wh. Hlf-hdy. ev.

tomentosa, 4', Dec., wh.

Uva-ursi, Ap., flesh pk., hdy. ev. trailer (*syn.* *Arbutus Uva-ursi*).

ARCTOTHECA.

Greenhouse herbaceous perennials (*ord.* Compositæ) allied to *Arctotis*. They succeed in peat, leaf mould, and loam in equal parts; and may be propagated by root division and by cuttings in the spring.

Principal Species :—

repens, Jy., yel.

ARCTOTIS.

Handsome, half-hardy, herbaceous perennials (*ord.* Compositæ) for dry, sunny places in beds or borders, or for pots in cool greenhouses. Soil, loam and leaf mould. The flowers are large and Daisy-like. They are propagated by seeds sown in heat in spring, or by cuttings placed in pots in a little heat at any season.

Principal Species :—

acaulis, 1½', Je., red, yel.

aspera, 2½', Jy., yel., a fine plant.

aureola, Ap., or. (*syn.* *aspera undulata* and *cuprea*).

Other Species :—

argentea, 1', Aug., or. yel. reptans, 9", Jy., wh., yel.
bellidifolia, 2', My., wh., rosea, 6", Sep., pk. (*syn.*
red (*syn.* *paniculata*). *breviscapa*).

leptorhiza, 1', Jy., or., speciosa } (*see* *acaulis*).
ann. umbellata }

ARDISIA.

Description.—Evergreen stove and greenhouse shrubs (*ord.* Myrsinæ), with rather small flowers, but bright, showy berries.

Propagation.—(1) By cuttings. Half-ripened side shoots taken during the summer months strike quickly in a brisk heat. (2) By seeds. The finest and ripest berries should be sown in spring in well drained pans filled with a compost of equal parts of loam and peat, with sand, and plunged in bottom heat.

Soil.—Two-thirds good loam, one-third peat or leaf soil, with enough sand to keep the compost open.

Other Cultural Points.—*Ardisia crenata* is the one best known, and the most useful. It delights in a fair amount of heat, 50° to 55° or 60° during

winter, and 60° to 75° in summer; and in plenty of moisture, both at the roots and overhead. Young single-stemmed plants in 6" pots make the best specimens, as in this size they are very useful as table plants or for general decorative work. Firm potting is essential to ensure short-jointed, stubby growth. Old plants may be cut back in the spring, and if water is withheld until the cuts have healed—the plants bleed freely otherwise—they will soon break into fresh growth, and may then be potted up. Scale and mealy bug are great pests, and the foliage and berries soon collect soot and particles of dust from the atmosphere. The constant use of the syringe, and the occasional employment of the sponge, are advisable. Weak soapy water makes a capital wash.

Principal Species :—

crenata (*syns.* *crenulata* and *crispa*), 3' to 4', Je., flowers red vio., berries bright coral red, hanging on for a long time. There is a white-berried var.

Other Species :—

crispa (*see* *crenata*).

humilis, 4', Je., berries

blk.

japonica, 1', wh., nearly

hd.

macrocarpa, 5' to 6',

grh., flesh berries, or,

sc.

Oliveri, Jy., flowers ro.

paniculata, 8' to 10', Jy.,

flowers ro., berries red.

polycephala, 3' to 4', wh.,

berries blk.

punctata, 6' to 10', Je.,

wh.

serrulata, 3', Jy., red.

villosa, Oct., flowers wh.

— *mollis*, berries red.

Wallichii, 2', Jy., flowers

red.

ARECA.

Stove Palms (*ord.* Palmae). A number of species formerly included under *Areca* are now referred to *Acanthophoenix*, *Euterpe*, *Hyophorbe*, *Kentia*, *Oncosperma*, *Ptychosperma*, and *Chrysalidocarpus*. They are propagated by seeds. Peat or leaf soil and loam in equal parts for the young plants, all loam, with sand, for the older, suit.

Principal Species :—

Catechu, the Betel Nut Palm, 30', leaves 3' to 6' long.

lutescens, the popular market Palm, now referred to the genus *Chrysalidocarpus*.

Other Species :—

Alcive.

concinna, 8' to 10'.

glandiformis, 30'.

triandra, 20'.

ARENARIA. (SANDWORT.)

A large genus of dwarf, hardy plants (*ord.* Caryophyllæ), comparatively few of which are worth growing; but some of the perennials are valued for rock gardening or for carpeting. They have generally narrow leaves and small white flowers. *Grandiflora* and *montana* are suitable for the front of borders, or for growing in pots in a cold house or frame. Propagated by division, seeds, or cuttings struck under glass. Loam, sand, and leaf mould are suitable. Plant in sunny, exposed positions in dry soil, except in the case of *balearica*, which thrives in a damp place.

Principal Species :—

balearica, 2", Mch., wh. A charming little creeping plant, with very small flowers.

grandiflora, 6", Je., wh. A handsome Alpine, with large flowers.

montana, 3", Ap., wh. Earlier than the preceding species. Flowers about equal in size.

purpurascens, 6", My., pur. A neat plant, especially desirable because of its distinct colour.

Arduina (*see* *Larissa*).

Other Species :—

ciliata, 6", Jy., wh.
Huteri, 1½", Je., wh.
laricifolia, 6", Je., wh.

saxatilis, 8", Je., wh.
rotundifolia, 6", Jy., wh.
verna, 3", My., wh. (*syn.*
cæspitosa).

ARENGA.

A genus of Palms (*ord.* *Palmæ*). The juice of *saccharifera* yields sugar, and its trunk sago. It needs plenty of heat, with a frequent use of the syringe, as thrips are troublesome; 40°. It is propagated by seeds, and two-thirds loam and one-third cow manure suit it.

ARETHUSA.

Pretty and uncommon terrestrial Orchids (*ord.* *Orchidaceæ*). They are nearly hardy, but require a mulching of leaves in winter. Well-rotted manure and sphagnum, with a little peat, suit.

Principal Species :—

bulbosa, 8", My., ro. pur., fragrant.

Other Species :—

ciliaris (*see* *Bartholina*). *plicata* (*see* *Pogonia*).

ARGANIA.

A greenhouse evergreen tree (*ord.* *Sapotacæ*), doing well in ordinary garden soil, and propagated (1) by layers, (2) by cuttings taken in autumn or spring, and covered with a bell-glass in a warm greenhouse.

Only Species :—

Sideroxylon (the Iron Wood), 15' to 20', Jy., yel. (*syn.* *Sideroxylon spinosum*).

ARGEMONE. (PRICKLY POPPY.)

Showy plants (*ord.* *Papaveracæ*) covered with prickles, and having flowers which bear a resemblance to those of the horned Poppy (*Glaucium*). Few but annual species are in cultivation in this country; these are sown where they are to bloom, in ordinary soil, in early spring. They like sun.

Principal Species :—

grandiflora, 2', Jy., wh., *mexicana*, 2', Je., yel.
hlf-hdy. per. — *albiflora*, 1', Jy., wh.
hispida, 2½', Aug., wh. *ochroleuca*, 2', Aug., yel.

ARGYREIA.

Greenhouse or stove climbers or shrubs (*ord.* *Convolvulacæ*), of vigorous habit and free-blooming tendencies. *Bracteata* and *speciosa* are used in India for the making of poultices, and *malabarica* has purgative properties. Propagated by cuttings under a hand-glass in bottom heat. Soil, light and rich, such as a mixture of equal parts of peat, loam, and sand.

Principal Species :—

cuneata, 4' to 5', Jy., pur. *speciosa*, 10', Jy., ro.
cymosa, 10', pk. *splendens*, 1', Nov., red.

Other Species :—

acuta, Jy., wh. *malabarica*, Je., cream.
capitata, Jy., pur. *pomacea*, pk.

ARGYROXIPHUM.

A greenhouse herbaceous perennial (*ord.* *Compositæ*). *Sandwicense* has purple flowers, and is clothed with silvery hairs; 3' (*syn.* *Argyrophyton Douglasii*). It is propagated by seeds, sown when ripe in gentle heat, and equal parts of loam and leaf soil, with sand, suit it.

Aretia (*see* *Androsace*).

Argolasia (*see* *Linaria*).

Argyrochata (*see* *Parthenium*).

Argyrophyton (*see* *Argyroxiphium*).

ARISÆMA.

Tuberous rooted stove, greenhouse, and hardy plants (*ord.* *Aroideæ*), often with curiously tailed flowers. Propagated by division of the rootstock.



ARISTOLOCHIA TRICAUDATA (*see* p. 74).

Peat and fibrous loam in equal parts, with a little sphagnum moss, some charcoal, and sand, form a good compost. Plenty of water, except when the plants are at rest, is a necessity. Liquid manure in the growing season is helpful.

Principal Species :—

atrorubens, 9" to 1', Je., hdy., grn., pur. br. (*syns.* *triphylllum*, *zebrinum*, and *Aram triphylllum*).
speciosum, 2', Mch., grh., wh., grn.

Other Species :

concinnum, 1' to 2', Je., st., wh., grn.
curvatum (*see tortuosum*).
gaieatum, 1', Jy., st., grn., wh.
Griffithii, 1' to 1½', Ap., hdy., br., vio., grn. (*syn. hookerianum*).
helleborifolium (*see curvatum*).
hookerianum (*see Griffithii*).
nepenthoides, 2', spr., st., yel., br., grn.
præcox (*see ringens*).
ringens, spr., hdy., wh., grn. (*syns. præcox* and *Sieboldii*).
Sieboldii (*see ringens*).
tortuosum, 4', Ap., st., wh., grn.
Wrayi, yel., grn.
zebrinum (*see atrorubens*).

ARISARUM.

Half-hardy herbaceous plants (*ord. Aroidæ*) of little garden value, allied to *Arisæma*. They are propagated by division of the rootstock in spring and by seeds. A mixture of equal parts of peat, loam, and sand suits them.

Principal Species :—

vulgare, 1', My., spathe pur.

ARISTEA.

Greenhouse herbaceous perennials (*ord. Iridæ*) of little horticultural value. Propagated by division of the rootstock in spring and by seeds. Three parts of peat and one part of loam, with sand, suit them.

Principal Species :—

capitata, 3', Jy., bl.
cyanea, 6', Je., bl.
melaleuca, 1', Je., bl.
platycaulis, 1', bl.
pusilla, 3', Jy., bl.
spiralis, 1', My., bl.

ARISTOLOCHIA. (BIRTHWORT.)

Description.—A large genus of stove, greenhouse, or hardy, evergreen or deciduous shrubs (*ord. Aristolochiaceæ*), climbers for the most part, by means of their twining stems. The plants are remarkable for the curious forms of their flowers, some of which are large and very handsome, but as a rule unpleasantly scented. The climbers make capital pillar or rafter plants, and from the pendulous habit of their flowers they need such a position to display them to advantage. *Sipho*, the Dutchman's Pipe, is a handsome hardy climber, planted chiefly for its foliage.

Propagation.—By cuttings of the young shoots, about 6" long, taken off with a heel of the old wood and inserted in heat under a bell-glass.

Soil.—Two-thirds loam, one-third well-rotted manure and sand.

Other Cultural Points.—As a rule, *Aristolochias* do best when planted out, although they may be grown in pots. Good drainage is essential, as they require plentiful supplies of water—less in winter—with occasional doses of liquid cow manure in the growing season. The growths should not be trained tightly to the roof, but allowed to hang. In most cases the flowers are borne upon the old wood, but in *ringens* they are produced upon the young shoots; the pruning must vary accordingly. The temperature should not be allowed to fall below 58°, even in winter, for the stove forms. Mealy bug is the only insect pest that gives much trouble.

Aria (*see Pyrus*).

Principal Species :—

brasiliensis, 20', Jy., st., pur., shaped like a bird's head. Ev. cl.
caudata, 5', Je., st., red. Cl.
Clematitis, 2', Jy., hdy., yel., erect. Herbaceous per., naturalised in parts of Britain.
Duchartrei, 5', Jan., st., tube br., limb light yel. The plant flowers from the old wood.
fimbriata, 6', Sep., st., pur. yel.
floribunda, 10', Jy., st., pur. red, netted yel. Cl.
gigas, 8' to 10', Je., st., pur., with a long tail. Cl.
— Sturtevantii, 7' to 9', Jy., st., pur., wh. grey edge, very large, and with long tails; very malodorous. Cl.
goldieana, Jy., st., grn., yel., very large, 25" long by 10" diameter is a common size. Cl.
odoratissima, 10' Jy., st., pur., fragrant. Ev. cl.



Photo: W. H. Waite.

ARISTOLOCHIA GIGAS STURTEVANTII.

Sipho, 15' to 30', My., Je., hdy., yel., br., cl. tomentosa, 10', Jy., hdy., pur., limb yel., cl. tricaudata, 2', Aug., st., pur., with three long tails. The best of the shrubby forms. (See page 72.)

Other Species :—

anguicida, 7' to 10', Dec., st., wh., br.
 barbata, 10', Jy., st., br.
 clypeata, sum., st., wh., pur.
 cordiflora, 30', My., st., yel., pur.
 deltoidea variegata, 6', st.
 galeata, 10', Aug., st., cream.
 indica, 10', Jy., st., pur.
 labiosa, 20', Jy., st., pur., grn., yel.
 leuconeura, 12', Sep., st., pur. br.
 ornithocephala (now brasiliensis macrocephala).
 ringens, 20', Jy., st., pur., grn., yel.
 saccata, 20', Sep., st., pur. red.
 sempervirens, 4', My., grh., pur.
 Thwaitesii, 3', Mch., st., wh.
 trilobata, 7', Je., st., pur.
 ungulifolia, Je., st., pur.

ARISTOTELIA.

Hardy or half-hardy evergreen shrubs (*ord.* Tiliaceæ), with handsome foliage and berries. Propagated by cuttings of the ripened wood inserted in sand under a hand-glass, and by layers. Ordinary garden soil.

Principal Species :—

Macqui, 6', My., hdy., flowers grn., berries blk. There is a variegated form.

ARMENIACA (see PRUNUS).

ARMERIA. (THRIFT, SEA PINK.)

Pretty, hardy perennials (*ord.* Plumbaginæ), for borders, edgings, or rockwork. The larger species make nice coolhouse plants in pots; they are very superior to the common native Thrift, maritima. Increased by seeds sown in spring under glass, or by cuttings, or rather pieces taken off with a part of the base attached, and struck in a frame or under handlights. Sandy soil, with the addition of leaf soil and peat. The larger species are best grown in the rock garden, for which all are suitable. It is safer to propagate mauritanica annually, as it is rather tender, and sometimes dies in winter.

Principal Species and Varieties :—

cæspitosa, 2½', Je., ro. A charming little Thrift for sunny crevices in rockwork (*syn.* juniperifolia).
 maritima (vulgaris), 6", Je., ro. The common Thrift, of which there are several varieties, suitable for edgings, etc. alba, wh., is good; and the form named lauchæana has bright crim. flowers.

mauritanica, 1½' to 2½', Jy., ro. or wh., the most ornamental of the genus, with large heads and flowers.

plantaginea, 1½', Je., ro., a good, tall species, harder than the preceding.

Other Species :—

cephalotes (*see* mauritanica). latifolia, 1½', Je., ro.
 dianthoides, 6", Je., pk. setacea (*see* juncea).
 juncea, 3", Je., ro. undulata, wh.

ARNEBIA. (PROPHET FLOWER.)

Description.—Charming perennials or annuals (*ord.* Boraginæ) with bright flowers, usually with five dark spots, which have given rise to the legend that they are the marks of the fingers of the prophet Mahomet (*syn.* Macrotomia).

Propagation.—By seeds, or by cuttings or root cuttings of the perennial species, the root cuttings being cut into pieces about 1" in length in early spring, and put in pots of light soil under glass in a little heat. The tops of these root cuttings should be just under the surface.

Soil.—The perennials like a rather strong soil,

but the annuals prefer one of sandy loam enriched with manure.

Other Cultural Points.—The Arnebias make good border or rockery plants, echioides being one of the finest rock plants we have.

Principal Species :—

cornuta, 1½', Jy., yel. A handsome ann., which should be sown in heat early in spring and grown on under glass until May.

echioides, 9", My., yel. A favourite with all growers of hdy. flowers.

Griffithii, 9", Jy., yel. A pretty ann.

macrothyrsa, 1½', Je., per., yel. A good species not in general cultivation.

ARNICA.

Hardy herbaceous perennials (*ord.* Compositæ) of dwarf stature, and with yellow flowers, closely related to Senecio. They are propagated by seeds, and by division of the roots in spring. Peat, loam, and sand in equal parts suit them.

Principal Species :—

Chamissonis, 1' to 2', Jy. to Sep., yel.

foliosa, 2', Aug., yel.

Other Species :—

Aronicum (*see* scorpioides). montana, 1', Jy., yel.
 scorpioides, 9", sum. (*syn.* Aronicum).
 Clusii, 1', sum. (*syn.* Clusii.)
 Doronicum Clusii.)

ARPOPHYLLUM.

Evergreen epiphytic Orchids (*ord.* Orchidaceæ). Propagated by division of the pseudo-bulbs. Equal parts of fibrous peat, loam, and broken crocks, with a few nodules of charcoal, suit them.

Principal Species :—

cardinale, 1', sum., ro. spicatum, 1', Ap., pur.
 giganteum, 2', Ap., pur., ro.

ARRACACIA.

A half-hardy perennial (*ord.* Umbelliferæ) with a tuberous rootstock, which is used for food in South America. It may be increased by division of the roots, and should be given a loamy soil.

Principal Species :—

esculenta, 2', Jy., wh. (*syn.* Conium Arracacia).

ARRHENATHERUM.

Perennial grasses (*ord.* Graminæ), propagated by seeds or division, and thriving in ordinary soil.

Principal Species :—

avenaceum, 5', Je.

ARROWROOT.

A starchy food used for children and invalids. It is obtained from various plants, but the ordinary West Indian arrowroot is obtained from the genus Maranta, which see.

ARTABOTRYS.

Pretty stove shrubs (*ord.* Anonaceæ). The leaves are supposed to be effective in cases of cholera. Propagated by cuttings of matured shoots under a bell-glass in gentle heat in spring, and by seeds.

Principal Species :—

odoratissimus, 6', Jy., red br., very sweet scented.

Arnoldia (*see* Dimorphothea).

Arnopogon (*see* Urospermum).

Aronia (*see* Crataegus and Pyrus).

Aronicum (*see* Arnica and Doronicum).

Arrowhead (*see* Sagittaria).

ARTANEMA.

Evergreen coolhouse shrubs (*ord.* Scrophularinæ) of some beauty, allied to *Torenia*. Propagated by seeds and by cuttings. Equal parts of loam, peat, and leaf soil, with sand, suit it.

Principal Species :—

fimbriatum, 2½', Je. to Nov., bl.

ARTEMISIA.

A large genus of herbaceous or shrubby perennials (Wormwood; Mugwort; Southernwood, *ord.* Compositæ), very few being of horticultural value from a decorative point of view. Many have a more or less pleasant aromatic scent. Propagated by division of the roots of the herbaceous species, by cuttings of the shrubby ones, and the annuals by seeds. Almost any dry soil, not too heavy, is favourable. The dwarfier species are best grown on rockwork, and the pretty sericea is benefited by covering with glass in winter to keep off rain.

Principal Species :—

Abrotanum, 4', Aug., yellowish. This is the old-fashioned Southernwood or Old Man, whose fragrant leaves are so well known.

Absinthium, 1½', Aug., yel. The common Wormwood, which is used for medicinal purposes.

argentea, 1', Jy., yel. Rather tender, requiring a warm border, but valued for its silvery appearance.

cana, 2½', Aug., yel. Like the preceding, valued for its silvery stems and leaves. It is hardier than argentea.

pontica, 2', Sep., yel. Roman Wormwood, used in bedding designs on account of its finely cut grey foliage.

sericea, 6'', greenish, of rather trailing habit, and one of the prettiest silvery leaved plants we have. Leaves very narrow.

vulgaris, 3', Aug., yel. Mugwort. For garden purposes the golden and variegated forms are the only ones of value.

Other Species :—

alpina, 9'', Jy., yel.

cærulescens, 2', Aug., bl.

frigida, 9'', Jy., yel.

maritima, 2', Aug., yel.

Mutellina, 6'', Aug., yel.

rupestris, 9'', Jy., yel.

stelleriana, 1½', Jy., yel.

tanacetifolia, 1½', Jy., yel.

ARTHROPODIUM.

Greenhouse herbaceous perennials (*ord.* Liliacæ) of considerable beauty. Related to *Anthericum*. The flowers are borne in rather straggling racemes. The leaves are grass-like. Propagated by divisions and by seeds. Loam and peat, with sand, suit.

Principal Species :—

neo-caledonicum, 1½', My., wh.

paniculatum, 3', My., wh. The var. minus is a pretty form.

Other Species :—

cirrhatum, 3', My., wh.

fimbriatum, 1½', Jy., wh.

pendulum, 1½', Je., Aug., wh.

ARTHROSTEMMA.

Stove or greenhouse evergreen shrubs (*ord.* Melastomacæ), rarely met with in cultivation, but well worthy of attention. Propagated by cuttings of half-ripened side shoots, taken in April or August, and placed under a bell-glass in bottom heat. For compost, use loam, peat, and sand in equal parts.

Artanthe (see *Piper*).

Arthropphyllum (see *Phyllarthron*).

Arthropteris (see *Nephrodium* and *Polypodium*).

Principal Species :—

fragile, 3', Je., st., ro. versicolor, 1', Sep., st.,
nitidum, 2', Je., grh., lil. wh., pk.

ARTICHOKE, CHINESE.

Description.—A prolific vegetable (*Stachys tuberosa*, *ord.* Labiatæ), producing small jointed tubers which are very acceptable in the autumn and winter. They may be used for salad as well as for culinary purposes.

Propagation.—From tubers planted in the autumn or spring.

Soil.—Any garden soil, but a light sandy loam is the best.

Other Cultural Points.—Select a piece of ground that has been well manured for a previous crop, and after being deeply dug, the top soil should be forked over at the end of March, and made level. Select tubers of even size, and plant with a dibber 1' apart, in rows 18" asunder. Hoe frequently during the summer, and give liquid manure in dry weather to ensure the tubers growing to full size. In October the crop may be lifted and stored in sand. Some prefer to leave the tubers in the ground, and lift them as required; but, in any case, care should be exercised in clearing the ground, as every small piece left will vegetate and become a nuisance the following season. Reserve a portion for planting in the spring, and store the tubers in dry sand or earth, as they are apt to commence growth if the material is damp.

ARTICHOKE, GLOBE.

Description.—The Globe Artichoke (*Cynara Scolymus*, *ord.* Compositæ), so called on account of the outline of the heads, has long held a position amongst the esculents in gardens. It is said to have been introduced to this country about the year 1548 from Italy, and has been grown more or less in gardens ever since, though it was cultivated and highly appreciated by the Greeks and Romans long before the above date. It is a hardy herbaceous perennial. The heads that are produced from July to October are usually boiled, and served with butter and salt.

Propagation.—From seeds and suckers. When the former method is adopted seeds may be sown in March or April in drills 18" apart, finally putting out the plants 3' apart. Seeds can also be sown in gentle heat, pricking off the plants into small pots, gradually hardening and putting out in prepared beds at the end of May. Growing plants from suckers is an expeditious and satisfactory way of propagating. Early in April select strong suckers, about 10" high, that have made some fibrous roots, and after removing the rough outer leaves transplant them singly 3' apart, in rows 4' asunder, making the soil about them firm. Earth up each plant with finely sifted coal ashes, mulch the ground between with long manure, and if the weather is dry apply water to enable the suckers to start into growth.

Soil.—Deep, rich loam.

Other Cultural Points.—Globe Artichokes should be given an open situation, free from drip, shade, and other influences of trees. The site for the crop should be selected in the autumn, deeply dug, and have a good dressing of rich farmyard manure incorporated with the subsoil. If the land is stiff and retentive add a fair dressing of road scrapings and sifted coal ashes. Two or three years is quite long enough to keep old plants, as young plant-

ations are more profitable. Summer treatment consists of the frequent use of the hoe, the removal of weak suckers, and an occasional supply of liquid manure. In the autumn all plants that are intended to remain for another season should receive attention. Remove the old flowering stems and decayed leaves, and place 3" or 4" of finely sifted coal ashes round each clump. In severe weather add to this a further mulch of strawy litter, leaves, or Bracken. This may be cleared away in March, and a dressing of manure given. There is no need to remove the ashes, as Artichokes have a particular liking for them, and they may be forked into the soil with the manure.

Chards.—These are the blanched summer growths of Globe Artichokes, and the blanching operation takes six or eight weeks. After the best heads have been cut, early in July, the stems and leaves must be cut down, and when the new growth is about 2' high it should be bound round with wreaths of straw, and soil or litter be drawn round the stems of the plants.

Varieties.—There are several varieties in cultivation, including the Large Green Globe, Green Globe, and Purple Globe. The former is one of the best, being rounded at the points and free from prickles; it is more tender than the other two mentioned, which are very good for general purposes.

ARTICHOKE, JERUSALEM.

Description.—The tubers (*Helianthus tuberosus*, *ord.* Compositæ) are cooked in several ways, and make a palatable dish. During the summer the plants make effective screens, and afford protection for more tender crops.

Propagation.—From medium sized tubers planted in the autumn or spring.

Soil.—Any ordinary garden soil will suffice, but Jerusalem Artichokes flourish best where the rooting medium is light.

Other Cultural Points.—The ground should be dug deeply and manured, if at all poor, before planting. Select medium sized tubers, and plant them 2' apart in rows 3' asunder, burying them to a depth of 6". The only attention required during the growing period is an occasional hoeing, and earthing up the soil to the stems if it is of a light character. About the middle of November cut the stems down and lift the crop. Select the largest and best shaped tubers for use, storing them in sand under cover, or pitting them in the open. Reserve the smaller tubers for making fresh plantations. Care should be taken to lift the whole of the crop, as the smallest piece of tuber left in the ground will vegetate, and growth appear the following spring. For this reason annual lifting and planting are desirable, or the crop becomes difficult to eradicate, and the tubers degenerate in size and quality.

Varieties.—There are several varieties of the species *Helianthus tuberosus*, the older forms having purple or reddish skinned tubers. A white skinned variety of modern introduction is superior in shape and quality to the old one, and equally as prolific.

ARTIFICIAL MANURES.

The term "artificial" is commonly applied to all forms of concentrated fertilisers, some of which are artificial or chemical, and others animal productions. A simple and more correct method is to classify these fertilisers as "organic" and "in-

organic," the former being applied to substances which represent material of which some animal or vegetable life has been composed, and the latter having no connection with anything that has had life.

Classification.—In order to be practical it is well to divide concentrated fertilisers into three classes—phosphatic, potassic, and nitrogenous; these being the three chief plant foods. Phosphates promote fruitfulness, and in garden and orchard the provision of phosphoric acid is the first essential for the best results. Potash plays an important part in the production of quality; size, colour, and flavour in fruits and vegetables are largely due to it. Nitrogen promotes growth, and is responsible for density of colour in leaves and vigour of plants. A combination of the above fertilisers makes up a complete manure. There are numerous specially prepared mixtures on the market, but the most economical method is to buy the ingredients, and mix them in the required proportions.

Principal Phosphatic Fertilisers :—

Basic slag is an excellent phosphatic manure for applying to soil which lacks lime and contains plenty of humus. It is obtained in the process of converting pig iron into steel, and its value depends partly on its fineness. It should be applied in the winter as a top-dressing on lawns and pastures, and be dug into the subsoil for vegetables and fruit crops at the rate of about 7 lb. to the square rod (30½ square yards).

Bone flour is an excellent fertiliser, particularly for heavy soil, and it is good for mixing with compost for Vine borders and pot plants. Bone flour should be finely ground to be of the greatest value, and though somewhat slow its effects are lasting.

Superphosphate (mineral) is a cheap and excellent phosphatic manure for general garden purposes. A good sample should be dull grey in colour, dry, and powdery. It may be dug into the soil prior to cropping, and be applied as a surface dressing to fruit and vegetables in the spring.

Potassic Manures :—

Kainit is a soluble salt, and the cheapest commercial form of potash. A good sample contains about 12 per cent. of potash, and in mixture with superphosphate it makes a valuable fertiliser.

Sulphate of potash is a purified form of kainit, and, being nearly four times as rich in potash, much smaller quantities are required. If potash is wanted during the growing season the sulphate is the best to apply. It is an excellent manure for Strawberries.

Muriate of potash is a powerful potassic manure, which gives excellent results on certain soils, both with fruit and vegetables. It is more expensive and powerful than kainit, and should be used with care. In conjunction with superphosphate it has been found good for Apples.

Nitrogenous Manures :—

Nitrate of Soda.—A quickly soluble and powerful manure, that is shipped in large quantities from South America, and contains about 15 per cent. of nitrogen. It is best used as a separate dressing, applying phosphate and potash early in the season, and following with light surface dressings of nitrate, say about 1 lb. per square rod at intervals, to stimulate growth.

Sulphate of Ammonia.—This is a waste product from gas and ironworks, and has the same effect

as nitrate, with the difference that it may be applied in one spring dressing, and is retained longer in the soil. Nitrate is the better for top-dressing when an immediate result is desired, but the effects of sulphate of ammonia are more lasting. Both these manures are injurious if brought into contact with the foliage of many plants, and care should be taken not to dust them over the leaves when applying to growing crops.

Though the quantities and proportions of fertilisers used must be governed by the character of the crop, and also the soil, the following mixtures are good for general purposes.

Bulbous Vegetables (principally Onions).—In addition to farmyard manure, soot, and wood ashes, apply in February a mixture formed of 4 lb. of superphosphate and 3 lb. of kainit per square rod, worked into the top spit. Give nitrate of soda or sulphate of ammonia in the spring in two or three top-dressings at the rate of 1 lb. per rod.

Greens (Cabbage tribe).—These plants are gross feeders, and in addition to animal manure a dressing of 4 lb. of kainit and 3 lb. of superphosphate per square rod may be dug into the soil, with top-dressings of nitrate at 1 lb. per rod.

Pod-bearing Vegetables (Peas and Beans).—Animal manure worked into the subsoil, with superphosphate forked into the surface soil at the rate of 7 lb. per square rod a few weeks before sowing, is excellent. Another good dressing is composed of 4 lb. of basic slag or bone meal per rod, incorporated with the subsoil in the winter, with 3 lb. of kainit and 2 lb. of sulphate of ammonia per rod applied a few weeks before sowing.

Tap Roots (Carrots, Parsnips, Beet).—Good roots can be grown on land that has been well manured for a previous crop without further feeding, but if plant food is required apply 3 lb. of superphosphate, 2 lb. of kainit, and 1 lb. of sulphate of ammonia per rod when preparing the ground for sowing.

Tuberous (Potatoes).—A complete manure is the best for Potatoes, and, if the ground is in a fair state of fertility, good crops may be grown with 4 lb. of superphosphate, 3 lb. of kainit, and 1 lb. of sulphate of ammonia or nitrate per rod. The first three may be applied in mixture before planting, but nitrate should be used as a top-dressing when earthing.

Apples, Cherries, Pears, and Plums.—Phosphoric acid is the chief food required, potash being beneficial on light soils, and applications of nitrogen should be governed by the conditions of growth. On heavy land basic slag and bone meal are good for winter dressings, and superphosphate and kainit or muriate of potash are excellent for spring applications on fairly light land.

Currants, Gooseberries, and Raspberries.—Basic slag and bone meal are good for winter application on heavy soil, and an excellent general mixture for hoeing into the ground in the spring is 4 lb. of superphosphate, 2 lb. of kainit, and 1 lb. of sulphate of ammonia per rod.

Strawberries.—When preparing plantations on heavy soil dig in basic slag at the rate of 8 lb. per rod. Superphosphate and sulphate of ammonia, 5 lb. of the former and 1 lb. of the latter, are good for spring dressing on light soil, and the safest way of applying potash is in the form of sulphate of potash at the rate of 2 lb. per rod.

Flowers.—For top-dressing hardy flower borders, Roses, annuals, Carnations, and other garden flowers in the spring, 3 lb. of superphosphate and 1 lb. of sulphate of ammonia per rod are good.

Lawns.—A good winter dressing for improving the appearance of scanty lawns is 3 lb. of basic slag and 1 lb. of kainit per rod, followed by a spring application of 3 lb. of superphosphate and 1 lb. of nitrate or sulphate of ammonia at the same rate.

ARTOCARPUS.

Stove evergreen trees (Bread Fruit, *ord.* Urticaceæ) allied to Antiaris, the Upas Tree. They need plenty of water at all times, with free drainage. Propagated by cuttings of the side shoots; and by suckers. Soil, two-thirds of good loam and one-third of leaf soil, with sand.

Principal Species :—

Canoni (*see* Ficus Canoni).
incisa, true Bread Fruit,
50'.

The fruit is produced in the leaf axils in big spherical heads.

Other Species :—

heterophylla.
integrifolia, Jaca or Jack Tree.

laciniata.
—metallica.

ARUM.

Description.—Handsome or singular perennial plants (*ord.* Aroideæ) suitable for the outdoor garden, or the conservatory and greenhouse. They all bear more or less resemblance in form to the favourite Arum Lily (*Richardia africana*), but are often singularly coloured. The markings on the leaves of some add much to their interest. The greater number of the plants formerly grown as Arums have been transferred by botanists to other genera, and these will be found under their proper titles. The leading ones thus removed will be found under one or other of the following genera: *Alocasia*, *Amorphophallus*, *Arisema*, *Arisarum*, *Biarum*, *Caladium*, *Colocasia*, *Dracunculus*, *Helicophyllum*, *Helicodiceros*, *Philodendron*, *Pinellia*, *Sauromatum*, *Spathiphyllum*, *Typhonium*, and *Xanthosoma*.

Propagation.—By division of the roots when they begin to make new growth in spring, or by seeds. Seeds of the tender species ought to be sown in a gentle heat, but those of the hardy plants will germinate either in a cold frame or in the open ground.

Soil.—Arums like a good, rich soil; where a compost is being prepared for them it may consist of about two parts of good loam and one part of decomposed cow or other animal manure, with the addition of a little rough sand. In the open ground they will flourish in any good garden soil if a little damp but well drained.

Other Cultural Points.—Most of the tender plants now retained in the genus *Arum* require little more than greenhouse temperature, and some do not even need as much heat as is generally maintained in one in which flowering plants are grown in winter. They must be kept dry and free from frost at that season. They may, however, be started into growth with a temperature of about 60° in spring. When the growing season is over, water may be gradually withheld, but when in growth they ought to have a full supply. The hardy species need no covering in most places. They are best suited for rock gardens, woodlands, or for planting in wild gardens.

Principal Species :—

Dracunculus (correctly *Dracunculus vulgaris*).

italicum, 1½', Ap., greenish wh. The Italian Arum is a neat plant for growing in a corner of the garden or on the lower parts of the rockery. Its variegated leaves are very pretty.

maculatum, 9", pur., grn. Our native Wake Robin, Cuckoo Pint, or Lords and Ladies, which is showy in autumn with its bright scarlet, poisonous berries.

palæstinum, 2', My., blk. A handsome but curious-looking plant, which is hdy. in the south, but ought to be grown under glass.

Soil.—Equal parts of good loam and leaf soil with plenty of sand.

Other Cultural Points.—Where possible the Bamboos should be associated together in a spot sheltered from the cold biting winds, which do much damage to the young leaves and shoots. They need plenty of water at all times, and such species as *japonica* are at their best when planted by the side of a lake or stream. In bleak localities some protection should be given during the winter, for the plants are only doubtfully hardy. If they do not actually succumb to a long spell of inclement weather it cripples their energies for a



Photo: Pocock & Co., Cape Town.

A FIELD OF ARUM LILIES (*RICHARDIA AFRICANA*) AT MOWBRAY, SOUTH AFRICA.

Other Species :—

crinitum (see *Helicodicer*).

detruncatum, 2', Ap., grh., grn. yel.

Dioscoridis, 1', spr., grh., pur.

Dracontium (see *Arisæma*).

hygrophilum, 1', grh., grn., pur.

numidicum (see *italicum*).

orientale, 1', Je., grh., greenish wh.

philistæum, 1', My., grh., pur.

ramosum, 3', st.

sanctum, 1½', My., grh., blk. pur. (probably a var. of *palæstinum*).

ARUNDINARIA.

Description.—A genus of hardy, half-hardy, and exotic Bamboos (*ord.* Gramineæ), some of which are of great decorative value. Twenty-four distinct species are given in the *Genera Plantarum*, but the *Index Kewensis* mentions forty-one species, apart from synonyms. *Nitida* is the handsomest of all, but *japonica* (*syn.* *Metake*) is probably the best known member of the genus.

Propagation.—By division of the rootstock. Very small pieces of the rhizomes, if they have healthy roots attached, soon make plants.

long time, and sometimes they never get over the check.

The following synonymy is that of the Kew *Hand-List*. It should be read with *Bambusa* and *Phyllostachys*.

Principal Species :—

falcata, 3' to 6', grh. (*syns.* *Bambusa gracilis* of gardens in part, and *B. falcata*).

Falconeri, 5' to 8', foliage bright grn. One of the hardest (*syn.* *Thamnocalamus Falconeri*, of *Hookf.*).

Fortunei variegata, 1' to 2½', grn. (*syn.* *Bambusa Fortunei variegata*).

Hindsii, 6' to 12', hdy. (*syn.* *Bambusa erecta* of *Sieb.*).

japonica, 4' to 8', hdy. (*syns.* *Bambusa Metake* and *B. japonica*).

nitida, 6' to 9', foliage olive, br., pur.

Simoni, 8' to 18', half-hdy. (*syns.* *Narihira-daké* of Japan, *Bambusa viridi-striata*, and *B. Simoni*). There is a variegated form.

Veitchii, 2' to 3', warm grh. (*syns.* *Bambusa tessellata* of gardens and *B. Veitchii*).

Other Species and Varieties :—

- anceps, 6' to 8', hdy.
 aristata, 8' to 12'.
 auricoma, 1½' to 4', hdy.
 (syns. *Bambusa Fortunei* aurea of gardens and *B. Maximowiczii* of gardens in part).
 chrysantha, 3' to 4', hdy.
 (syn. *Bambusa chrysantha*).
 Fortunei compacta, 6' to 12'', grh.
 Hindsii graminea, 1½' to 4½' (syns. *Taimin-*
chiku of Japan and *Bambusa graminea*).
 humilis, 3' to 4', hdy. (syn. *Fortunei* of gardens).
 macrosperma tecta, 3' to 4', hdy.
 Maximowiczii (see *auricoma* and *Simoni* variegata).
 metallica, 2½' to 3', half hdy.
 nobilis, 8' to 10', hdy.
 pumila, 12'' to 18'', hdy. (syn. *Bambusa pumila* of gardens).

ARUNDO. (REED.)

Description.—Noble hardy or nearly hardy plants (*ord.* Gramineæ), very ornamental on grass, by the waterside, or for sub-tropical gardening. They are also decorative in large conservatories. When in bloom they are especially fine with their tall spikes of feathery plumes.

Propagation.—By division or by seeds in spring. They may also be propagated by putting the stems in water; rooted plants spring from the joints.

Soil.—Although the *Arundo* grows in any good soil, it ought to have a rather damp place to display its true character.

Other Cultural Points.—*Arundo Donax* is reputed to be hardier than the Pampas Grass, but that is not the universal experience. *Conspicua* is less hardy than *Donax*, and ought to be protected in winter except in gardens in the south. Where any doubt exists it is safer to cover the stools with ashes or dry litter.

Principal Species :—

- conspicua*, 8', Aug., silky wh. A splendid plant, with fine panicles of great beauty.
Donax, 12', Aug., reddish, passing off wh. The Great Reed. A handsome plant. The form *versicolor* has its leaves prettily striped with wh. It is much dwarfer, and seldom exceeds 3' or 4' in height.
madagascariensis, 12' to 18', a grh. species of much beauty.
mauritanica, 12', grh.

ASAFÆTIDA.

The medicinal gum so well known for its disagreeable odour is obtained chiefly from *Narthex asafætida*.

ASARUM.

Hardy and greenhouse herbaceous perennials (*ord.* Aristolochiaceæ). They make curious and not unattractive rockery plants. Propagated by division of the roots in spring. Equal parts of loam and leaf soil, with sand.

Principal Species :—

- canadense*, 1', Je., br. *caudatum*, Jy., br. red.

Other Species :—

- albivenium*, grn. pur. *macranthum*, br., yel., grh., pur.
arifolium, 1', Je., br. *parviflorum*, pur., grn.
europæum, 1', My., br. *Thunbergii*, 6'', My., pur.
geophilum, 9'', Nov., grh., pur. *virginicum*, 1', My., br.

ASCLEPIAS. (SWALLOW-WORT.)

Description.—A genus of distinct-looking and valuable hardy or tender perennial plants (*ord.* Asclepiadææ) of considerable beauty and interest in the garden. There are upwards of eighty species.

Propagation.—In the case of the hardy species, by division of the roots in spring, or by seeds

sown under glass at the same season or when ripe. The stove species are propagated by division in spring; by cuttings struck in a moderate heat at that season and covered with a bellglass; or by seeds, also sown in heat.

Soil.—The hardy *Asclepiases* thrive best in a soil composed of peat, with a little sand, or a light, rich loam, with the addition of some leaf soil. The stove species should have fibrous loam, with a good proportion of leaf mould added.

Other Cultural Points.—Some of the species are true marsh plants, or have their habitats in moist soil. Others like dry ground. Of the former may be named *lanceolata*, *rubra*, *pulchra*, *Sullivantii*, *speciosa*, and *perennis*; the others appreciate a drier situation. Many should have a little protection in winter, such as ashes over the crowns.

Principal Species :—

Cornutii, 4', Jy., pur. A pretty border plant with fragrant pale-coloured blooms (syn. *syriaca*).
curassavica, 3', Jy., or sc. A distinct st. plant, the wh. variety, *alba*, being pretty to associate with it.

incarnata, 2', Jy., red. A nice plant for a wet border or an artificial bog, in the drier parts.

tuberosa, 2', Jy., etc., or. The most brilliant of the border species. It is rather troublesome to establish, and ought to have a dry place, with a little covering in winter in cold districts.

Other Species :—

- atrosanguinea aurea*, 3', Jy., st., red. *pulchra*, 3', Jy., red (now *incarnata pulchra*).
decumbens, 2', Jy., or. (now *tuberosa decumbens*). *purpurascens*, 2½', Jy., pur.
lanceolata, 3', Jy., wh. *quadrifolia*, 1', Jy., wh.
mexicana, 2½', Jy., grh., *rubra*, 1½', Jy., red (syn. *acuminata*).
wh. *speciosa*, 2½', Jy., pur.
perennis, 3', Jy., wh. *Sullivantii*, 3', Jy., pur.
phytolaccoides, 3', Jy., *variegata*, 3½', Jy., wh.
pur. *verticillata*, 2', Jy., wh.

ASCYRUM.

Herbs and sub-shrubs (*ord.* Hypericinæ) with black-dotted leaves and yellow flowers. Allied to *Hypericum*. They are not quite hardy, and protection during winter is necessary. Propagated by division of the roots in spring, and by seeds. Peat, leaf soil, and sand in equal quantities.

Principal Species :—

Crux-Andrææ, 2', Jy., yel. This is the hardiest of all the species.

Other Species :—

- amplexicaule*, 2', Jy., yel. *pumilum*, 1', Jy., yel.
hypericoides, 2', Aug., yel. *stans*, 2', Aug., yel.

ASH.

Well-known deciduous timber trees of considerable beauty. The wood is white, straight-grained, very tough and elastic. It is much used by wheelwrights, and in the making of horticultural and agricultural implements. When cut back every six or seven years *Ash* forms a useful covert plant. Beautiful as the *Ash* is when in leaf, it is an undesirable tree to have in the garden, as the mat of fibrous roots takes possession of every inch of soil within reach. For species and varieties see *Fraxinus*.

ASH, MOUNTAIN.

The Mountain *Ash*, or Rowan tree (see also *Pyrus*), is a very beautiful tree with white flowers followed by scarlet berries in large bunches. Its botanical name is *Pyrus Aucuparia*. It can be grown in any soil and is very ornamental. The form *fructu-luteo* has yellow fruit, *fastigiata* is of

Ascaricida (see *Vernonia*).

erect habit, pendula has weeping branches, and variegata has variegated leaves. The Mountain Ash grows from 10' to 30' in height. The American Mountain Ash is *Pyrus americana*.

ASHES.

These are the remains of substances which have gone through the process of burning, and their value as fertilisers depends on the character of the material from which they are obtained. Whatever that material may be, the slower the process of change the better, for then more carbon or charcoal is preserved in the refuse, and this is one of the most valuable constituents of the ashes. When green timber, sticks, and garden refuse are burnt for the production of ashes, slow combustion should be effected by getting a good body of fire, and then banking the burning material over with sods or retentive soil, leaving a small opening, sufficient to admit enough air to keep up a smouldering fire. By this method the largest amount of valuable refuse is obtained.

Coal Ashes.—The application of the contents of the domestic ashpit to garden soil may be beneficial or otherwise, according to the character and condition of the land. The fertilising properties of coal ashes are very small, and their chief value lies in their mechanical effect on stiff clay soil. Land that is heavy and retentive can be made more porous by coal ashes incorporated with the subsoil. The injurious effects of this material are observed where ground is treated to heavy applications year by year. Frequent large dressings will cause light, fertile loam to lose its holding power, and the chief virtues of the soil to depart. They lead to scab in Potatoes. A few garden vegetables appreciate finely sifted coal ashes, and the material is useful for protecting the crowns of plants and bulbs that need such treatment through the winter. For plunging pots of bulbs before they start growth, and making beds on which to stand pot plants, ashes are very suitable. They are also valuable for making dry walks in kitchen gardens and other places.

Wood Ashes.—Waste sticks, prunings, trimmings, and weeds, which collect in every garden, may be put to a useful purpose by reducing them to ashes. Potash is the chief fertilising property contained in this material, and previous to application the ashes should be kept dry, because if exposed to heavy rains the above constituent is washed out, and the chief value of the material is lost. Fruits and vegetables appreciate wood ashes, and the material is also valuable for mixing with soil for pot plants. The potash is of great benefit to Strawberries. In the kitchen garden they may be applied to Onions, Carrots, Beet, and Potatoes with advantage. Light surface dressings of wood ashes improve the appearance of thin and patchy lawns.

Peat Ashes.—Silica, gypsum, and carbonate of lime are contained in these, and they are useful for vegetable crops and lawns.

Turf Ashes.—These are obtained by the burning of turf sods, and contain fertilising properties in small proportions, rendering them useful for surface dressings on grass, and for digging into the soil for vegetable crops.

ASIMINA (*syn.* ORCHIDOCARPUM).

Hardy, usually deciduous, shrubs (*ord.* Anonaceæ) of no great decorative value. Propagated by

layers in autumn, and by seed. Soil—sand and peat in equal portions.

Principal Species :—

triloba, 10', My., pale pur., yel. Papaw or Custard Apple (*syn.* *Anona triloba*).

ASPALATHUS.

Cool-house herbs or sub-shrubs (*ord.* Leguminosæ), indigenous to the Cape, with a single exception. Propagated by cuttings of matured shoots. Soil—equal proportions of peat, loam, and sand.

Principal Species :—

Over 100 have been described, but they are rarely seen, and it would be complete waste of space to describe them. The following is a small selection :—

affinis, 3', Jy., yel. *globosa*, 3', Jy., or.
albena, 4', Jy., wh. *sericea*, 2', Jy., yel.

ASPARAGUS (ORNAMENTAL).

Description.—A genus of herbs or shrubs (*ord.* Liliaceæ), most of them climbers, with small and inconspicuous flowers succeeded by red, orange, or black berries. Most of the decorative forms delight in the temperature of a warm greenhouse or stove. Some are excellent basket plants, and of these *retrofractus* and *Sprengeri* are the chief. The popular *Smilax* is now placed in this genus. It is extensively cultivated both in this country and America for its long trails of rich green, which last exceptionally well when cut. Consignments of these trails have been successfully shipped from New York to Covent Garden. *Plumosus* and *p. nanus* are well-known substitutes for Maidenhair Fern, which they greatly outlast in the cut state. The lightness and elegance of the sprays make them first favourites with the florist.

Propagation.—By seeds, sown in brisk heat as soon as they are ripe; by layers; and by root division.

Soil.—Equal parts of loam and leaf soil, with a little sand.

Other Cultural Points.—Plenty of water is required during the growing season, but less in the winter, when even the evergreen forms are to some extent at rest. This curtailing of the water supply is especially necessary with *plumosus* when it is growing in a cool house, otherwise the leaves turn yellow and many of the "needles" fall. *Plumosus* is usually trained to a trellis or pillar. *P. nanus* needs very little support.

Asparagus medeoloides, the popular *Smilax*, formerly called *Myrsiphyllum*, is largely grown by training its growths to long strings running from the ground to the roof of the house. Such is the strength of healthy plants that they will frequently make 12' of growth in one season. The shoots may be cut back close to the ground, and this encourages the tuberous root thongs to throw up others. The plants are kept regularly syringed, and weak liquid cow manure mixed with soot is given occasionally in the height of the season. The temperature for all the warm greenhouse Asparagus should not be allowed to fall below 50° in winter. The chief insect pest is mealy bug, which must be watched for continuously. If once it gets a footing amongst the "fronds" of *plumosus* there is nothing for it but to cut the plant back, since insecticides cannot penetrate the dense network of needles.



Photo : E. J. Wallis, Southfields, S.W.

ASPARAGUS VERTICILLATUS IN BERRY.

Principal Species :—

æthiopicus, 10', st., wh.
 broussonetii, 10', My., hdy. climber, berries red.
 comorensis, 4' to 9', like plumosus but darker.
 medeoloides, Smilax, 5' to 12', Je., grh. climber,
 grn., wh. (*syns.* Myrsiphyllum asparagoides and
 Medeola asparagoides).
 plumosus, 3' to 10', spr., grh. climber, wh.,
 berries blk. (*syn.* consanguineus).

-- nanus, 1' to 3', grh.
 -- sanderi.
 -- tenuissimus.
 retrofractus, 6', Jy., wh., grh.
 scandens, grh., wh., berries or.
 Sprengerii, 1' to 3', st. or warm grh
 variegatus.
 verticillatus, berries red.

Other Species :—

aethiopicus *ternifolius*,
(see *falcatus*).
Cooperi, 10' to 12', Ap.,
My., grh., climber.
crispus, grh.
decumbens (see *crispus*).

falcatus, 3', grh.
racemosus, 3', My., grh.
ramosissimus, Je., grh.,
climber.
tenuifolius, 3', wh., half-
hdy.
virgatus.

ASPARAGUS (CULINARY).

Description.—A delicious, edible-stemmed, garden vegetable (*Asparagus officinalis*, *ord.* Liliaceae), suitable for forcing and outdoor culture. The plant is a native of Britain, and grows wild in the light, sandy soil along some parts of the coast.

Propagation.—From seeds and by division of roots. The former is a ready means of propagation, but not so quick in giving returns as the latter. To form permanent plantations from seeds, mark out beds 5' wide, which will accommodate four rows of seeds, leaving a 2' alley between the beds. Sow the seed in March, in drills 1" deep and 1' apart, and thin the seedlings to 9" apart before they overcrowd each other.

Planting.—April is a good time for planting roots. Mark out the beds as before, and make narrow trenches 1½' apart and 6" deep for the reception of the plants. Have everything ready before lifting the roots, which should be exposed to the air as little as possible. Allow 1' between the plants, spread out the roots evenly, and cover the crowns with the finest soil to the depth of 3". It is a good practice to raise Asparagus from seeds one season, and make permanent beds of the seedlings the second, in the above manner.

Soil.—Deep, sandy loam, enriched with animal manure, suits Asparagus well. Where the soil is of a stiff, clayey nature, there should be a liberal addition made of road scrapings, old mortar rubble, and wood ashes.

Other Cultural Points.—If the soil is deep and well drained, Asparagus beds may be formed on the flat, but on wet, retentive land they should be raised a little above the general level. As the crop is practically a permanent one, the preparation of the ground at the outset should be liberal and thorough. Select the site for the beds in the autumn, trench deeply, placing a layer of the longest manure in the bottom, and another of more

decayed material on the top of the second spit. In the case of ground naturally unsuitable for Asparagus, wheel out a portion of the soil, and replace it with a mixture of the material recommended in the preceding paragraph. To preserve the shape of the bed, drive in a short wooden post at each corner. The summer culture consists of keeping down weeds. Early in November the stems should be cut close to the ground, the beds cleaned, and mulched with half-decayed manure, spreading the fine soil from the alleys over the

dung. In April the beds should receive attention, and the greater part of the manure be raked down into the alleys. On light soils a good sprinkling of salt may be applied with advantage at this period. Liquid manure is highly beneficial to Asparagus during the growing season, and the size and quantity of the heads may be increased by applications of concentrated fertilisers. A good dressing in the early spring is formed of 3 oz. of kainit and 2 oz. of superphosphate of lime to the square yard, to be followed by a fortnightly application of ½ oz. of nitrate of soda per square

yard while heads are being cut. No heads should be cut till the second year after planting, and the operation should cease for the season at the end of June. Under proper treatment a well-established bed will continue productive for many years. Instances of beds more than fifty years old are recorded.

Forcing.—Asparagus may be forced from the beginning of November till cutting commences outdoors. There are various methods adopted, and with houses provided with bottom heat roots may be taken up and placed in boxes of soil, or be temporarily planted under glass. A simple mode of forcing is to make up a hot-bed with littery manure and leaves. Place a frame on the bed, and when the heat is on the decline put in 3" or 4" of light soil. Take up the roots, lay them close together on the bed, and cover with 3" of soil. A temperature of from 60° to 65° is suitable, and in frosty weather protection must be afforded. Syringe the bed in the morning and afternoon, and when the heads come weakly remove the roots, and substitute others. It is a good plan to raise a succession of plants from seed for forcing, as they are useless after this operation.



Photo: Cassell & Company, Ltd.

ASPARAGUS SPRENGERI VARIEGATUS. (See p. 81.)

Varieties :—

Connover's Colossal is one of the best grown, but there are several others, including Argenteuil and a few other varieties.

Asparagus Beetle (*Crioceris Asparagi*).—This blackish green beetle is about $\frac{1}{2}$ " long, and the larvæ, which are dull green in colour, do considerable damage by eating the tender parts of the young shoots and foliage, causing a check to the growth, and weakening the plants. When full fed the grubs bury themselves in the ground, and change to pupæ. They emerge again in a few weeks, and commence laying eggs. During the spring and summer several broods are produced, and the increase is therefore rapid. Burn old stems in the autumn to destroy any eggs that may be on them, and rake refuse and rough manure from the beds. Dust the plants with slaked lime when moist with dew or rain. Syringe with an insecticide formed by dissolving 4 oz. of soft soap in 3 gallons of hot water. Stir into the mixture 2 oz. of soot and 2 oz. of flowers of sulphur. Apply warm, and after syringing dust soot over the surface of the bed.

Asparagus Knife.—An implement used for severing the heads of Asparagus beneath the surface of the ground. The short blade at the end is provided with small teeth after the manner of a saw, and so arranged that a sharp downward thrust severs the fleshy stem. Though varying a little in make, all Asparagus knives have a slender steel stem between the blade and the handle. They are handy and useful implements, because they enable the operator to cut the Asparagus head at its full length, and they save the blunting of ordinary knives by sticking them into the ground.

ASPASIA.

Stove epiphytic Orchids (*ord.* Orchidaceæ), succeeding in baskets in a mixture of sphagnum, peat, crocks, and charcoal.

Principal Species :—

papilionacea, 9", yel., variegata, 9", Feb., yel., mottled br. spotted red, fragrant.

Other Species :—

epidendroides, 1', Feb., lutea, Mch., yel. wh. yel. principissa, grn., br. lunata, 1', Feb., grh., psittacina, grh., br., pur. wh., br.

The Aspasia of Salisbury is now referred to Ornithogalum, which *see*.

ASPEN.

(*Populus tremula*.) A familiar deciduous forest tree of rapid growth, considerable height, and great spread of branches. The wood is soft and white, and, although not durable, is in request for the making of various household utensils. The leaves are very thin and membranous, and flutter with the slightest breeze. This has probably given rise to the superstition that it was the Aspen upon which Judas hanged himself, and that as a consequence the leaves have never been still since. (For species and varieties *see* POPULUS.)

ASPERULA. (WOODRUFF.)

Pretty plants (*ord.* Rubiaceæ) for the shady parts of rockeries, borders, and for wild gardening. All are hardy, but a few of the Alpine species suffer from wet in winter unless protected. With a few exceptions, those named are perennials. The flowers are small, and the leaves narrow. They are propagated by division of the roots in spring or summer, and by seeds sown in spring. Almost any

common soil will do, except for the Alpines, which should have a light, peaty one.

Principal Species :—

arcadiensis, 3", Ap., pk. A beautiful little Alpine, fine for rockwork.

azurea, 1', Jy., bl. A charming plant with bl. flowers, which are valued for bouquets. A fragrant hdy. ann. (*syn.* orientalis and azurea setosa).

cynanchica, 9", Je., wh. A pretty little native plant, which does best in sun.

odorata, 9", My., wh. Our native Sweet Woodruff, prized for its odour when the leaves and stems are dried.

Other Species :—

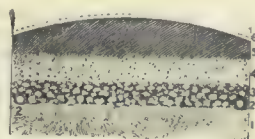
galioides, 1', Jy., wh. hexaphylla, $1\frac{1}{2}$ ", Jy., wh. lævigata, 1', Je., wh. nitida, 9", Je., ro.

taurina, 1', Je., wh. tinctoria, $1\frac{1}{2}$ ", Je., wh. trichoides, 1', Je., ann., wh.

ASPHALT.

This name is applied to various artificial preparations, in the composition of which boiled gas-tar is indispensable. Thus asphalt felt makes a capital waterproof covering for sheds and out-buildings through being soaked in boiled tar. Yards, garden walks, and pavements covered with asphalt are dry, firm, and enduring if the material is properly made and put down. Take two parts of dry lime rubbish, with one part each of coal ashes and sand, the whole to be finely sifted. All the ingredients should be in a perfectly dry state, and thoroughly mixed together. Leave a hole in the centre of the heap, and into this pour boiling coal-tar. Mix it well by turning the heap, and when sufficient tar has been added to make it like stiff mortar, it is ready for use. In making asphalt walks it is necessary that there

should be a firm foundation, and nothing is better for this than a layer of brick ends broken small. On this place another layer of fine gravel or coal ashes, rolled down firm and level, and finish off with the asphalt 2" or 3" thick (*see* figure). With a view to the walk being dry, all the material should be laid so as to be highest in the middle, with a slight fall to each side. Sprinkle a good coating of coarse sand on the surface, and when cold pass a light roller over it. See that the material is made smooth and even while soft, and in a few days the walk will be hard enough for traffic.



SECTION OF ASPHALT WALK.

- 1 Soil.
- 2 Drain pipes.
- 3 Foundation of broken brick ends.
- 4 Layer of small gravel or ashes.
- 5 Asphalt 3 inches thick, raised in the centre to allow water to run off.
- 6 Sand.

ASPHODELINE.

Hardy herbaceous perennials (*ord.* Liliaceæ), distinguished from Asphodelus by the upright, leafy stems. Propagated by division of the roots in spring or late autumn. Any good garden soil containing plenty of humus suits.

Principal Species :—

imperialis, 8', sum., pk. lutea, 3' to 4', sum., yel. The double form of this, flore pleno, is like the type in all except the double flowers.

taurica, 1' to 2', sum., wh. (*syn.* Asphodelus tauricus).

Other Species :—

brevicaulis, sum., yel. tenuior, 1', yel. (*syns.*
 damascena, 1½' to 2', wh. cretica and Asphodelus
 liburnica, 1½' to 2', yel. tenuior).

ASPHODELUS. (ASPHODEL.)

Handsome hardy flowers (*ord.* Liliacæ) of much value for borders. They have long, narrow leaves and spikes of effective flowers. Propagated by division of the roots after flowering, and by seeds sown in pots or boxes in spring and placed in a frame. The greater number of the Asphodels should have a strong soil, but they can be grown in a lighter one also. Acaulis requires a light, dry compost.

Principal Species :—

acaulis, 1½', Ap., My., pk. A very pleasing plant, which blooms even earlier than the time stated in very early districts. Rather tender.

albus, 2', My., wh. A favourite with many, and a nice little Asphodel. A sub-species of ramosus.

ramosus, 5', My., wh. A noble plant when well grown, and capital for a shady border in good soil.

Other Species :—

asiaticus, 2', Je., wh. creticus (*see* Asphodeline
 comosus, 2½', Jy., wh. liburnica).

ASPIDISTRA.

fistulosus, 2', Jy., wh.

Description.—Greenhouse evergreen perennials (*ord.* Liliacæ). Amongst the most useful ornamental foliaged plants for rooms, corridors, and cool conservatories.

Propagation.—Division of the roots and suckers, in spring.

Soil.—Three parts loam, two parts leaf mould, one part sand.

Other Cultural Points.—Aspidistras will thrive with deficient light, and in a dry atmosphere—conditions that would be fatal to other subjects—and consequently they make excellent room plants. They are perfectly at home in a cool stove or greenhouse, and if watered liberally they continue to grow in a root-bound condition. If allowed to remain in this state too long, however, the leaves come small, and have a sickly appearance. The best time for potting is in the spring.



ASPIDIUM CAPENSE. (*See* p. 85.)

Principal Species :—

elator, 1½' to 2'.

— variegata.

lurida, 1' to 1½', grn.,

lanceolate leaves (lurida of gardens is now referred to elator).

— variegata, variegated leaves.

punctata, 1', now referred to elator.

typica, 1' to 1½'.



ASPIDIUM ARISTATUM VARIEGATUM. (*See* p. 85.)

ASPIDIUM.

Description.—A large genus of stove, greenhouse, and hardy Ferns (*ord.* Filices), now including Cyclo-dium, Cyclopeltis, Cyrtomium, and Polystichum.

Propagation.—By spores, sown when ripe.

Soil.—Three parts of sandy peat, one part of loam, and a few pieces of broken sandstone.

Other Cultural Points.—The hardy species and varieties do splendidly underneath the partial shade of trees. A top-dressing of leaf soil may be given with advantage at the commencement of the winter, and the dead fronds should be left to afford some protection to the crowns. Plenty of water is necessary at all times. The stove and greenhouse forms do not need quite so much shade as the majority of other Ferns, for their fronds are generally of a more leathery texture. Temperature for the greenhouse, 45° minimum; for the stove, 60° minimum.

Principal Species and Varieties :—

[The figures refer to the length of the fronds.]

acrostichoides, 1' to 2', hdy. (*syn.* Polystichum acrostichoides). Grandiceps and incisum are two pretty vars., but there are many others.

aculeatum, Hard Shield Fern, 1' to 3', hdy. (*syn.* Polystichum aculeatum). Proliferum and vestitum are two handsome forms.

angulare, Soft Shield Fern, botanically only a var. of aculeatum, hdy. (*syn.* Polystichum angulare). There are innumerable vars., some of the best being alatum, grandiceps, Kitsoniæ, lineare, proliferum, and Woollastonii.

capense, 1' to 1½', grh. (*syns.* coriaceum and *Polystichum capense*, see figure, p. 84).

fœniculaceum, 1½' to 2', grh. (*syn.* *Polystichum fœniculaceum*).

Lonchitis, Holly Fern, 1' to 2', hdy. (*syn.* *Polystichum Lonchitis*).

munitum, 1' to 2', hdy. (*syn.* *Polystichum munitum*).

triangulum, 1' to 1½', st. or grh. (*syn.* *Polystichum triangulum*).

— ilicifolium, 6" to 12", grh.

varium, 1' to 1½', grh. (*syns.* *Lastrea varia* and *Polystichum varium*).

Other Species and Varieties :—

amabile, 1' to 2', st. (*syn.* *Polystichum amabile*).

anomalum, 2' to 3', st. (*syn.* *Polystichum anomalum*).

aristatum, 1' to 2', grh. (*syn.* *Polystichum aristatum*).

— conifolium.

— variegatum, 1' to 1½'.

auriculatum, 1' to 1½', st. (*syns.* *ocellatum* and *Polystichum auriculatum*).

— lentum.

— marginatum.

confertum (see *meniscioides*).

coriaceum (see *capense*).

falcatum, 1' to 2', grh. (*syn.* *Cyrtomium falcatum*).

— caryotideum, grh. (*syn.* *Cyrtomium caryotideum*).

— Fortunei, grh. (*syn.* *Cyrtomium Fortunei*).

falcinellum, 9" to 12", grh. (*syn.* *Polystichum falcinellum*).

flexum, 2' to 3', st. (*syn.* *Polystichum flexum*).

frondosum, 1½' to 2', grh. (*syn.* *Polystichum frondosum*).

Hookeri, 2' to 3', st. (*syns.* *nephrodioides* and *Cyclodium Hookeri*).

laserpitifolium, 1' to 1½', grh. (*syns.* *Lastrea Standishii* and *Polystichum laserpitifolium*).

lepidocaulon, 1' to 1½', grh. (*syn.* *Polystichum lepidocaulon*).

meniscioides, 2' to 3', st. (*syns.* *confertum* and *Cyclodium meniscioides*).

mohrioides, 6" to 12", grh. (*syn.* *Polystichum mohrioides*).

mucronatum, 1' to 1½', grh. (*syn.* *Polystichum mucronatum*).

nephrodioides (see *Hookeri*).

ocellatum (see *auriculatum*).

pungens, 2' to 3', grh. (*syn.* *Polystichum pungens*).

repandum, 2' to 2½', st.

rhizophyllum, st. (*syn.* *Polystichum rhizophyllum*).

Richardi, 10" to 18", grh. (*syn.* *Polystichum Richardi*).

semicordatum, 2' to 3', st. (*syn.* *Polystichum semicordatum*).

setosum, 1½' to 2', grh. or half-hdy. (*syn.* *Polystichum setosum*).

trapezioides (see *viviparum*).

triangulare laxum (*syn.* *Polystichum xiphioides*).

trifoliatum, 1' to 1½', st.

— heracleifolium.

tripteron, 1' to 1½', grh. (*syn.* *Polystichum tripterum*).

viviparum, 1' to 1½', st. or grh. (*syns.* *trapezioides* and *Polystichum viviparum*).

makes an elegant basket Fern, a little live *Sphagnum* may be usefully introduced.

Other Cultural Points.—The hardy forms are mostly deciduous, and thus need little water during the winter, although a mulching of leaf soil



ASPENIUM LUNULATUM. (See p. 87.)

serves the double purpose of keeping the roots fresh and moist, and of protecting them from frost. The stove and greenhouse species and varieties need plenty of water at all times, and *Nidus* and its varieties are by no means averse from the use of the syringe. Liquid cow manure is a capital stimulant through the summer months, and it may be varied occasionally with a little clear soot water. The chief insect pests are thrips, and Snowy Fly (*Aleyrodes*), and they are especially troublesome to the forms with broad, leathery pinnae, such as *obtusatum lucidum*. Fumigation will do no harm if it is not very strong, and this, with the occasional use of the sponge, should serve to keep insect pests under. Temperature for the greenhouse forms, winter minimum, 40°; stove, 58° to 60°.

Principal Species and Varieties :—

[The figures refer to the length of the fronds.]

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Adiantum-nigrum</i> , Black Spleenwort, 6" to 12", hdy. There are several pretty varieties, of which the undermentioned are the best :— | <i>Colensoi</i> , 6" to 9", grh. |
| — <i>acutum</i> , 9" to 12", very graceful. | <i>dimorphum</i> , 2' to 3', st. or warm grh. (<i>syns.</i> <i>diversifolium</i> , of gardens, and <i>Darea dimorpha</i>). |
| — <i>grandiceps</i> , 4" to 6", prettily crested. | <i>falcatum</i> , 6" to 12", grh. |
| <i>alatum</i> , 12" to 18", st. | <i>Filix-fœmina</i> , Lady Fern, 1' to 3', hdy. (<i>syn.</i> <i>Athyrium Filix-fœmina</i>). This fine species is exceedingly variable, and there are hundreds of varieties in cultivation. The R.H.S. has certificated upwards of a hundred since 1849. The following are a few of the best :— |
| <i>Belangeri</i> , 12" to 18", tufted, st. (<i>syns.</i> <i>veitchianum</i> and <i>Darea Belangeri</i>). | — <i>acrocledon</i> . |
| <i>bulbiferum</i> , 1' to 2', grh. A very pretty and variable species. The undermentioned varieties are some of the best :— | — <i>acuminatum</i> . |
| — <i>fabianum</i> , 9" to 15", grh. (<i>syns.</i> <i>fabianum</i> and <i>fœniculaceum</i> , of gardens). | — <i>Barnesii</i> . |
| — <i>laxum</i> , 1' to 1½', grh. | — <i>coronatum</i> . |
| — <i>minus</i> , 6" to 9", grh. | — <i>crispum</i> . |
| <i>Ceterach</i> , Scale Fern, 4" to 6", hdy. (<i>syn.</i> <i>Ceterach officinarum</i>). | — <i>dissectum</i> . |
| — <i>aureum</i> , 9" to 15", grh. (<i>syn.</i> <i>Ceterach aureum</i>). | — <i>grandiceps</i> . |
| — <i>ramoso-cristatum</i> , 8" to 10", crested. | — <i>minimum</i> . |
| <i>cicutarium</i> , 6" to 15", st. | — <i>multifidum</i> . |
| | — <i>Victorie</i> . |
| | <i>flaccidum</i> , 1' to 3½', grh. (<i>syns.</i> <i>odontites</i> and <i>Darea flaccida</i>). An elegant Fern of pendent habit, suitable for baskets. |

ASPENIUM.

Description.—A very extensive and widely distributed genus of hardy and exotic Ferns (*ord.* *Filices*), exhibiting a wonderful amount of variation in height, habit, and cutting of the fronds. Many of them are amongst the most valuable occupants of our cool and warm Fern houses, and the genus is the heaviest contributor to the hardy fernery, one species alone, *Filix-fœmina*, numbering its varieties by the hundred.

Propagation.—By spores, in all cases; and by "bulbils" in a few instances, as, for example, *bulbiferum* and its varieties, and *viviparum*.

Soil.—The hardy species and varieties do well in any light soil abounding in humus. For those requiring stove and greenhouse temperatures, equal parts of loam and peat, or loam and leaf soil, with sand, answer well. A few pieces of charcoal are beneficial. In the case of *longissimum*, which



ASPENIUM SHEPHERDI (See p. 87.)

fontanum, 3' to 6'', hdy.
(*syn.* Halleri).
— refractum.
furcatum, 6'' to 18'', grh.
(*syn.* premorsum).
goringianum pictum, 4''
to 15'', grh. (a variety
of macrocarpum).
lanceolatum, 6'' to 9'', hdy.
— crispatum.
— microdon, 4'' to 6'', st.
longissimum, 2' to 8',
st., pendulous.
Nidus, Bird's Nest Fern,
2' to 4', warm grh.
— australasicum, 2' to 4',
st. (*syn.* Thamnopteris).

Other Species and Varieties:—

abscissum, 6'' to 12'', st.
(*syn.* firmum).
acuminatum, 1' to 2', grh.
(*syn.* polyphyllum).
affine, 12'' to 18'', st.
(*syn.* spathulinum).
alismæfolium, 6'' to 9'',
st. (*syn.* Anisogonium
alismæfolium).
alternans, 6' to 8', grh.
(*syn.* Dalhousiæ).
alternifolium (*see* ger-
manicum).
amboinense, st.
angustifolium, 1½' to 2',
grh.
anisophyllum, 1' to 2', grh.
apicidens, a form of Vieil-
lardii).
arborescens, 3' to 4', st.
(*syn.* Diplazium arbor-
escens).
Arnottii, 1½' to 3', grh.
(*syns.* diplazioides and
Diplazium Arnottii).

— multilobatum, 2' to 3',
(*see* p. 87).
— musæfolium, 3' to 6', st.
obtusatum lucidum, 1' to
2½', grh. (*syn.* lucidum).
spinulosum, 9'' to 12'',
grh. (*syn.* Athyrium
spinulosum and Cysto-
pteris spinulosa).
Thwaitesii, 1' to 1½', st.
Trichomanes, Maidenhair
Spleenwort, 6'' to 12'',
hdy.
— cristatum, 4'' to 6'', grh.
— incisum, 3'' to 6'', grh.
viviparum, 1' to 1½', st.
— nobile, 1½', st.

aspidioides, 1' to 2', grh.
(*syn.* multisectum).
attenuatum, 1' to 1½', grh.
aureum, a variety of
Ceterach.
auritum, 6'' to 12'', st.
(There are several vars.)
australasicum, a form of
Nidus.
axillare of Aiton (*see* um-
brosum).
bantamense, 10'' to 2',
grh. (*syns.* fraxinifolium
and Diplazium
bantamense).
Baptistii (*see* Vieillardii).
barbadense, 3'' to 5'', st.
bipartitum, 6'' to 8'', st.
bisectum, 12'' to 18'', st.
brachypterum, 6'' to 8'', st.
(*syn.* Darea brachyp-
terum).
brevisorum, 2' to 3', st.
(*syn.* Athyrium brevi-
sorium).

Campbelli, 5'' to 9'', st.
caudatum, grh., close to
falcatum.
celtidifolium, 2' to 4', st.
compressum, 2' to 3', st.
or grh. (fecundum of
the Continent).
conchatum, 3' to 4', st.
(*syn.* Athyrium con-
chatum).
contiguum, 1' to 1½', grh.
crenatum, 1' to 1½', hdy.
cultrifolium, 6'' to 12'',
st. (*syn.* Diplazium cul-
trifolium).
Dalhousiæ (*see* alternans).
decurrens, 1½' to 1½', st.
decussatum, 2' to 4', st.
(*syn.* Anisogonium dec-
ussatum).
dentatum, 2'' to 3'', grh.
dimidiatum, 6'' to 15'', st.
diplazioides (*see* Arnottii).
diversifolium, of gardens
(*see* dimorphum).
ebeneum, 1' to 1½', grh.,
close to Trichomanes.
erectum (*see* lunulatum).
erosum, 6'' to 12'', st.
esculentum, 4' to 6', st.
(*syn.* Anisogonium escu-
lentum).
extensum, 1' to 2', grh.,
related to A. Tricho-
manes.
fabianum (*see* bulbiferum
fabianum).
fernandezianum, a variety
of lunulatum.
ferulaceum, 1' to 2½', st.
(*syn.* Darea ferulacea).
fijiense, 1½' to 2', st.
firmum (*see* abscissum).

fissum, 2'' to 5'', grh.
(*see* abscissum).
flabellifolium, 6'' to 12'',
grh.
— majus, a larger form.
fecundum (*see* compress-
um).
feniculaceum, a variety of
fragrans.
— of gardens (*syn.* bulbi-
ferum fabianum).
formosum, close to Tri-
chomanes.
fragrans, 1' to 9'', grh.
Franconis, 1' to 2', st.
(Diplazium Franconis).
gemmiferum, grh., re-
sembles obtusatum.
germanicum, 2'' to 3'', hdy.
giganteum (*see* radicans).
grandifolium, 2' to 3', st.
(*syn.* Diplazium grandif-
olium).
Grevillei, 1' to 1½', st.
griffithianum, 6'' to 12'',
grh.
Halleri (*see* fontanum).
Harrisii, 3'' to 6'', half-
hdy.
Hemionitis, 4'' to 6'',
warm grh. (*syn.* pal-
matum).
— cristatum, warm grh.
— multifidum, warm grh.
heterocarpum, 6'' to 15'',
st.
heterodon (*see* vulcani-
cum).
heterophlebium, 1½' to 2',
st. (*syn.* Anisogonium
heterophlebium).
hians, 3' to 4', st. (*syn.*
Diplazium hians).



ASPENIUM OBTUSATUM LYALLII. (See p. 87.)

- hookerianum, 4" to 11", grh.
 incisum, 6" to 12", grh. (*syn. elegantulum*).
 japonicum, 9" to 15", grh. (*syn. Diplazium japonicum*).
 javanicum (*see* *Allantodia brunoniana*).
 lanceum, 6" to 9", grh. (*syn. subsinuatum* and *Diplazium lanceum*).
 laserpitiifolium, 1' to 4', grh.
 laxum (*see* *bulbiferum laxum*).
 lineatum, 1' to 2', st. (*syn. nodulosum*).
 lucidum (*see* *obtusatum lucidum*).
 lunulatum, 6" to 18", st. — erectum.
 — fernandezianum, 6" to 18", st.
 macrocarpum, 1' to 2', grh. (*syn. Athyrium macrocarpum*).
 marginatum, 4' to 6', st. (*syn. Hemidictyum marginatum*).
 marinum, Sea Spleenwort, 6" to 18", hdy.
 — coronans, 4" to 6", hdy.
 — crenatum, 4" to 8", hdy.
 — mirabile, 3" to 8", hdy.
 — plumosum, 6" to 15", hdy.
 — ramo-plumosum, 6" to 12", hdy.
 — Thompsonii, 6" to 10", hdy.
 maximum, 2' to 4', st. (*syn. Diplazium decurrens*).
 melanocaulon, 2' to 3', st. (*syn. Diplazium melanocaulon*).
 Michauxii, 9" to 2', hdy., a form of *Filix-femina*.
 monanthemum, 1' to 1½', grh.
 montanum, 2" to 3", grh.
 multisetum (*see* *aspidioides*).
 musæfolium (*see* *Nidus musæfolium*).
 nigripes (*syn. Athyrium nigripes*).
 niponicum, 1' to 1½', grh. (*syn. Athyrium niponicum*).
 nitens, 1½" to 2", st.
 nitidum, 2' to 3', grh. (*syn. Darea Novæ-Caledoniæ*).
 Novæ-Caledoniæ, 15" to 2', st.
 obtusatum, 6" to 12", grh.
 — Lyallii, 1', warm grh. (*see* figure, p. 86).
 obtusifolium, 1' to 1½', st.
 obtusilobum, 4" to 6", st. (*syn. Darea obtusiloba*).
 odontites (*see* *flaccidum*).
 oxyphyllum, 1' to 2', grh. (*syns. Athyrium oxyphyllum* and *Lastrea eburnea*).
 paleaceum, 6" to 9", st.
 palmatum (*see* *Hemionitis*).
 paradoxum, 1' to 2', st. (*syn. zamioides*).
 parvulum (*see* *trilobum*).
 Perkinsii, 1½' to 2½', st.
 persicifolium, 2' to 3', st.
 Petersenii, 1½' to 2' (*syn. Diplazium decussatum*).
 Petrarchæ, 2" to 3", grh.
 pinnatifidum, 3" to 6", grh.
 planicaule, 6" to 12", grh.
 plantagineum, 6" to 9", st. (*syn. Diplazium plantagineum*).
 polyphyllum (*see* *acuminatum*).
 præmorsum (*see* *furcatum*).
 prolongatum (*see* *rutæfolium*).
 pteridoides, 9" to 1', st.
 pulchellum, 3" to 6", st.
 pumilum, 4" to 6", st.
 rachirhizon (*see* *rhizophorum rachirhizon*).
 radicans, 3' to 5', st. (*syn. giganteum*).
 resectum, 6" to 15", grh.
 rhizophorum, 1' to 2', st.
 — rachirhizon, 1' to 2', st. Much cut.
 rhizophyllum, 6" to 12", grh.
 — myriophyllum, 9" to 15", grh.
 rutæfolium, 6" to 15", grh. (*syns. prolongatum* and *Darea rutæfolia*).
 Ruta-muraria, Wall Rue, 1" to 2½", hdy.
 salicifolium, 1' to 1½', st.
 Sandersonii, 6" to 9", grh.
 scandens, 1' to 1½', st. (*syn. Darea scandens*).
 Schimperii, 1 to 1½', st. (*syn. Athyrium Schimperii*).
 schizodon (*see* *Viellardi*).
 Schkuhrii, 1½' to 2', st. (*syn. Diplazium Schkuhrii*).
 Selosii, ½" to ¾", grh.
 septentrionale, 3" to 9", hdy.
 Serra, 3' to 4', st.
 — natalensis, st.
 Shepherdi, 1' to 1½', st. (*syn. Diplazium Shepherdi*).
 — inæquilaterum.
 spathulimum (*see* *affine*).
 splendens, 6" to 12", grh.
 subsinuatum (*see* *lanceum*).
 sundense (*see* *vittæforme*).
 sylvaticum, 1' to 2', st.
 thelypteroides, 1' to 2', hdy. (*syn. Athyrium thelypteroides*).
 trilobum, 1" to 1½", grh. (*syn. parvulum*).



Photo: E. J. Walter, Southfields, S.W.

ASPENIUM NIDUS MULTILOBATUM, A BEAUTIFUL FORM OF THE BIRD'S NEST FERN. (*See* p. 86.)

umbrosum, 2' to 5' (*syns.*
Allantodia australe,
Athyrium umbrosum,
and axillare of Aiton).
vagans, 3" to 5", st.
varians, 4" to 6", grh.
veitchianum (*see* Belan-
geri).
Vieillardii, 6" to 9" (*syn.*
schizodon).
viride. Green Spleen-
wort. 4" to 6", hdy.
vittaeforme, 1' to 1½', st.
(*syn.* sundense).
vulcanicum, 1' to 2', st.
(*syn.* heterodon).
zamioides (*see* paradoxum).
zeylanicum, 6" to 12", st.
(*syn.* Diplazium zey-
lanicum).

ASSONIA.

Stove evergreens (*ord.* Sterculiaceæ, now often referred to Dombeya). They are not of any horticultural value. Cuttings of young shoots strike quickly in bottom heat. Loam and peat in equal quantities make a good compost.

Principal Species :—

populnea, 15', Je., wh. viburnoides, 10' to 20'.

ASTARTEA.

An evergreen shrub (*ord.* Myrtaceæ). Fascicularis, 6' to 9', May, white, likes a mixture of loam, peat, leaf soil, and sand. It may be increased by cuttings under a bell-glass in a temperature of 60°.

ASTELIA.

Greenhouse perennials (*ord.* Liliaceæ) of no special horticultural value. There are several species, and all do well in a mixture of two parts of loam, one part of peat, and a dash of sand. They may be propagated by division in the spring.

ASTELMA.

A small genus of evergreen greenhouse shrubs from the Cape (*ord.* Compositæ), now referred to Helipterum. Propagated by seeds, and cuttings of half-ripened shoots. Peat, leaf mould, and sand, with plenty of drainage, suit.

Principal Species :—

canescens, 1½', Je., pur. speciosissimum, 8', Jy.,
eximium, 3', Jy., crim. wh.

ASTEPHANUS.

A small genus of evergreen stove climbers (*ord.* Asclepiadææ) of no great importance. Propagation may be effected by division, and a compost of peat, loam, and leaf soil will suit.

Principal Species :—

linearis, 4', Jy., wh. triflorus, 4', Jy., wh.

ASTER, PERENNIAL. (STARWORT, MICHAELMAS' DAISY.)

Description.—The perennial Asters (*ord.* Compositæ) are now appreciated at almost their true worth where hardy border flowers are much grown, although the value of some of the species and varieties is not yet realised for growing in pots. As pot plants many are very beautiful, and do well if associated with the flowers of Chrysanthemums and other late autumn plants. In borders or beds they are indispensable at a time when the more tender flowers of autumn are cut down or are disfigured by frost or stormy weather. In some large places an "Aster garden" has been formed, which is a picture of colour when the ordinary garden is almost flowerless. There is much variety in height and habit, as well as in colour, among the Starworts, and the work of raisers of seedlings has given us many beautiful varieties. It is desirable that those who wish to begin growing these Asters should see a representative collection in bloom, and select those they prefer. Besides the late-blooming Asters, there is the pretty, dwarf-growing,

early-flowering alpinus, in some variety, which comes into flower about June.

Propagation.—By division of the plants in spring; by seeds, sown in autumn or spring; or by cuttings.

Soil.—A good, rich soil, well manured, is needed to bring the greater number to perfection, but some of the taller species become too gross for any but the largest borders when the ground is rich, so that in their cases it is advisable to plant in a poorer compost to make them more manageable and ornamental.

Other Cultural Points.—Few plants require less attention than the hardy perennial Asters, but in planting at first the soil should be well bastard trenched and manure liberally applied, so that it may not be necessary to replant for some time. They may need watering in dry weather, and when water is necessary a copious supply ought to be given. The greater number will require staking in good time. As many of the taller species and varieties are too tall for some borders, it may be found desirable to cut the plants down when they are about 12" or 15" high. They will spring afresh, and the check given by this cutting down will retard their flowering little, if anything, while the plants will be dwarfer. Established plants should be divided every few years. If the plants are allowed to seed before removing the old stems in winter, it will be safer to weed out any young seedlings which may appear close to the old plants. These are not likely to come true if in a mixed collection. Plants intended to be grown in pots may be potted in spring, and the pots plunged outside until required to be taken in in autumn. For growing in this way none are better than the species and their varieties which have small flowers in great numbers. Those of the cordifolius, vimineus, and ericoides class are the most useful for this purpose. The few greenhouse species are principally evergreen, and are grown from cuttings or seeds. They should be treated like ordinary greenhouse plants.

Principal Species and Varieties :—

[NOTE.—As there are over 200 species, and a number more (150) have been described as such, it is impracticable to do more than give an imperfect list of the best of the genus.]

acris, 3', Aug., lil. pur. A pretty early-flowering plant, which is covered with a profusion of starry flowers. The var. dracunculoides is very pretty.

alpinus, 6", Je., Jy., pur. A valuable little plant for the front of the border or rock garden. The vars. superbus, speciosus, albus, and roseus are all worth growing. Guard against slugs.

Amellus, 2', Aug., pur. One of the best of the Starworts. The flowers are large, handsome, and brightly coloured. The form bessarabicus is superior, and major is very fine. New vars. named Framfieldii, Onward (*see* p. 89), Riverslea, and Stella are all improvements on the type.

cordifolius, 2', Jy., mauve. A charming Aster with a multitude of small flowers. Beautiful vars. are named albulus, elegans, Diana, and major.

diffusus, 2', Oct., wh. A valuable Starwort which has pretty sprays of flowers of small size. The best forms are horizontalis and pendulus.

dumosus, 1½', Oct., mauve. A neat border or rockery plant of compact habit, and with small blooms.

ericoides, 2½', Oct., wh. A plant which gives charming sprays for cutting. There is a nice,

early-blooming form called Clio, which has blush flowers.

grandiflorus, 2½', Nov., vio. A very fine Starwort, but too late in bloom for cold localities.

lævis, 2', Sep., bl. A valuable species which has given some nice vars.; among them being Apollo, Arcturus, Ariadne, Calliope, decorus, formosissimus, and Harvardii. All are good.

Linosyris, 1', Aug., yel. The old Goldilocks, a pretty plant with heads of small, bright flowers (*syns.* Chrysocoma Linosyris, Linosyris vulgaris).

Novæ-Angliæ, 6', Sep., pur. Although of rather tall habit in strong soils, this is a very useful species; the vars. roseus and ruber being valued



ASTER AMELLUS ONWARD. (See p. 88).

for their ro. or crim. flowers. Mrs. J. F. Rayner, præcox, pulchellus, Wm. Bowman, and Woolston are all good vars.

Novi-Belgii, 4', Sep., bl. A valuable species and one which has given some fine vars., too numerous to detail. The form lævigatus is capital (*syn.* longifolius formosus), and others to be recommended are Daisy Hill, Madonna, Autumn Glory, Cottage Maid, Daphne, Edith, E. G. Lowe, Ella, F. W. Burbidge, Irene, John Wood, Maia, Mrs. C. W. Earle, Robert Parker, Pleiad, Top Sawyer, and White Spray.

puniceus, 6', Sep., bl. A handsome plant with crim. stems and cupped flowers. The best var. is pulcherrimus, blush-wh.

Tradescantii, 4', Oct., wh. A capital plant for cutting. Sprays of small flowers and Heath-like foliage.

turbinellus, 3', Aug., mauve. A very fine Starwort with pretty blooms.

versicolor, 3', Sep., pk., wh. A pretty species, good vars. being nanus, Antigone, and Themis.

vimineus, 3½', Sep., wh. One of the most useful for cutting; it gives elegant sprays of small flowers. Good vars. are Cassiope and nanus.

Other Species :—

acuminatus, 2', Sep., wh.

Alberti, 3', Aug., pur.

altaicus, 1', Jy., bl. pur.

amethystinus, 3', Oct.,

pur. bl.

Bellidiastrum, 1', Jy.,

wh. (*syn.* Bellidiastrum

Michellii).

Bigelovii, 2½', Aug., bien.

lil.

cassiarubicus, 2', Sep., pk.

caucasicus, 1½', Jy., pur.

Chapmanii, 2½', Sep., vio.

concinus, 2', Oct., pur.

concolor, 1', Oct., pur.

Coombe-Fishacre, 3', Sep.,

flesh.

corymbosus, 2', Jy., wh.

Curtisii, 3', Sep., lil.

diplostephioides, 1½', Je.,

pur.

Douglasii, 4', Sep., pur.

elegans, 2', Sep., bl.

formosissimus, 2½', Sep.,

lil.

floribundus, 3', Sep., pur.

gymnocephalus, 1', Jy.,

half-hdy. ann., ro.

Henryi, 2', Aug., bl.

Herveyi, 1½', Sep., lil.

incisus, 2½', Aug., bl. or

wh. (*syn.* Calimeris in-

cisa).

lanceolatus, 5', Sep., wh.

lindleyanus, 2', Sep., bl.

longifolius, 3', Oct., wh.

Maackii, 2', Aug., bl.

multiflorus, 4', Sep., wh.

paniculatus, 4', Sep., bl.

(vars. Dot; W. J.

Grant).

patulus, 3', Sep., pur.

peregrinus, 1', Aug., pur.

Porteri, 2', Aug., wh.

polyphyllus, 4½', Sep., wh.

ptarmicoides, 1½', Aug.,

wh.

pulchellus, 1', Jy., pur.

pyrenaicus, 1½', Jy., lil.

pur.

salsuginosus, 1½', Jy., pur.

(*syn.* Erigeron salsugin-

osus).

sericeus, 3', Jy., grn., bl.

(*syn.* argenteus).

Shortii, 3', bluish.

sikkimensis, 3', Oct., pur.

spectabilis, 2½', Sep., bl.

Stracheyi, 1½', Jy., bl.

Thomsoni, 2', Aug., lil.

trinervis, 2', Aug., bl.

trinervius, 3', Oct., wh.

Tripolium, 2', Aug., bl.

umbellatus, 2', Aug., wh.

undulatus, 3', Aug., bl.

Vilmorinii, 2', Jy., bl. pur.

ASTER ("CHINA").

Description.—Half-hardy annuals (now referred botanically to the genus *Callistephus*, *ord.* Compositæ), of easy culture. In its wild state the China Aster is single, but numerous double varieties have been obtained under cultivation, and a range of form and colouring has been developed of a widely diversified character. Most of the varieties are so far fixed as to come true from carefully selected seed. For late summer and autumn flowering, Asters are amongst the most useful and effective of annuals.

Propagation.—From seeds. To raise plants early sow the seeds in March in pans or small boxes filled with light soil and placed on a greenhouse shelf; or sow in shallow drills in a bed of soil, placed over a gentle hotbed, in a frame. As soon as the seedlings are large enough to handle they should be carefully lifted and pricked off in a frame to increase in size, and become gradually hardened prior to being planted at the end of May. Another method is to sow seeds in shallow drills, 6" apart, in a bed of fine soil made up in a cold frame about the middle of April. Prick off the seedlings when large enough into another frame, and plant them out when danger of frost is over. Dwarf, sturdy plants are thus obtained. Failing the above facilities, seeds may be sown thinly in a bed of rich soil outdoors early in May.

Soil.—Asters like a deep, rich soil in a situation exposed to sunshine. The ground should be dug deeply before planting, and a moderate dressing of thoroughly decomposed manure worked into the subsoil, as this has the effect of attracting the roots and affording assistance when the plants are expanding and perfecting their flowers.

Other Cultural Points.—The end of August and September are the months for Asters, and they are very effective in masses, or about 1' apart in single rows along borders. They are moisture loving plants, and are much benefited by the

heavy dews of the late summer. Planting should be done in showery weather, and water given during dry spells throughout the summer. Early in August, before the plants come into bloom, a top-dressing of well-decayed manure spread on the surface and watered in will be of great assistance. The dwarf varieties are self-supporting, but stakes are necessary for those of taller habit.

Enemies and Diseases.—Black fly almost invariably attacks young Asters. Green fly also attacks them in dry seasons. Soak a handful of quassia chips in a gallon of water, and dip the tops into it. Watch for the pests through the spring and summer, and syringe with quassia water when a trace of fly can be seen. Slugs are very partial to small seedlings. A close watch should be kept for them, and the plants dusted with lime and soot. Occasionally Asters damp off suddenly just below the ground. There appears to be no effective remedy, and a stock of reserve plants should be kept to take the places of any that may fail.

Pot Culture.—Asters in pots are very effective when in flower in the greenhouse. For this purpose sow the seeds outdoors in May, grow the plants thinly, and lift and pot when the buds are expanding in September. Keep the potted plants shaded for a few days, and then remove them to a cold greenhouse, where they will flower through the autumn.

A Selection of Varieties.—There is now a host of varieties in each of the leading sections of Asters, and they have almost entirely taken the place of the species in gardens. The tall-growing forms are suitable for exhibition and cutting, and those of dwarfer habit for bedding and pot culture. The principal sections and characters are tabulated below:—

TALL HABIT.	DWARF HABIT.
Comet, 1½', graceful, twisted florets.	Bouquet, 6", free flowering, suitable for pots.
Crown, 1½'.	Chrysanthemum-flowered (dwarf), 1', compact.
Emperor, 2', large flowered.	Comet (dwarf), 9", early.
Pæony-flowered, 2', large, incurved flowers.	German (dwarf), 9", early.
Quilled, 1½', quilled florets.	Pæony-flowered (dwarf), 1', incurved florets.
Victoria, 1½', florets recurved.	Victoria (dwarf), 1', good for pots.

All the above can be bought in collections of separate colours, or mixed.

The following are the chief species and varieties:—

hortensis, 1½', Jy., bl. (syn. chinensis).	— multiplex, 1½', Jy., var.
— albus, 1½', Jy., wh.	— ruber, 1½', Jy., red.
— brachyanthus, 1½', Jy., wh.	— variegatus, 1½', Jy., var.

ASTERACANTHA.

A greenhouse herbaceous perennial (*ord.* Acanthaceae) of easy culture. Longifolia, 2', July, yellow, likes a sandy loam, and to be kept rather dry. The genus is referred by botanists to Hygrophila.

ASTILBE (*syn.* HOTEIA). (GOAT'S BEARD.)

Description.—Exceedingly valuable garden flowers (*ord.* Saxifragaceae), used largely for borders; for the margins of lakes and ponds; and for forcing in pots, for which nearly all are suitable. They form fine plants for the conservatory, greenhouse, or window.

Asteriscus of Manch (see *Odontospermum*).

Asterocephalus (see *Scabiosa*).

Asterostigma (see *Staurostigma*).

Propagation.—By division in spring or autumn.

Soil.—A rich, moist soil is the best for all the Astilbes.

Other Cultural Points.—Plants in ordinary flower-borders and those in pots must never be allowed to suffer from want of water while growing. For forcing purposes good clumps should be potted early in autumn and plunged in ashes or other material until they form roots, when they may



Photo: Cassell & Company, Ltd.

ASTILBE W. E. GLADSTONE.

be taken in and subjected to gentle forcing, keeping them in a moist atmosphere and giving a plentiful supply of water.

Principal Species and Varieties:—

astilboides, 3', My., wh. Generally known as *Spiræa astilboides*. With its fine form, floribunda, it is valued as a pot plant, but it is equally good outside in moist places (*syns.* *spiræoides* and *Spiræa astilboides*).

japonica, 2', My., wh. One of our most useful forcing plants. Though it suffers in some gardens in spring in the open, in others it flowers freely from year to year. There is a pretty variegated variety, named *variegata* or *reticulata*, and one with pur. leaves and stems, called *foliis-purpureis* (*syns.* *Spiræa barbata* and *japonica*, *Hoteia japonica*, and *Astilbe barbata*).

rivularis, 4', Jy., wh. A noble plant for the margins of lakes, large borders, or wild gardens, always in deep, moist soil. It flowers well in shade.

Thunbergii, 1½', My., wh. A pretty little shr. which ought to be more used for forcing, but is a good plant for the border.

W. E. Gladstone, a fine seedling.

Other Species :—

decandra, 3', My., wh. rubra, 5', Jy., ro.
chinensis, 2', Jy., wh.
(syn. odontophylla).

ASTIRIA.

A stove evergreen (*ord.* Sterculiaceæ) succeeding in a mixture of two parts loam, one of peat, and a dash of sand, and increased by cuttings kept close in a warm place. Rosea, which flowers in May and June, has rose flowers.

ASTRAGALUS.

Description.—An extensive and variable genus of hardy herbs or sub-shrubs (*ord.* Leguminosæ), known as Milk Vetches. Upwards of a hundred species have been introduced to cultivation, but most of them have been lost. Some are of annual duration, but the majority are perennials. Some of the dwarf trailers make pretty plants for the rockery.

Propagation.—By cuttings and by seeds in a cold frame for the shrubs, by root divisions and by seeds for the herbaceous perennials, and by seeds only for the annuals, such as Cicer and Glaux.

Soil.—Equal parts of loam and leaf soil, with sand, for the annuals and herbaceous perennials; rather more loam for the shrubs.

Principal Species :—

adsurgens, Je., per. bl. pur., rare.
alopecuroides, 2' to 5', Je., per., yel.
hypoglottis, 3' to 4', Je., bl. Var. alba, wh.
(syn. dasylottis).
maximus, 2' to 3', Je., per., yel.
monspessulanus, Je., pur. A pretty evergreen trailer.
onobrychioides, 9" to 12", Jy., per., pur.
Tragacantha (Gum Tragacanth), 1½' to 3', Je., evergreen shr.
vulpinus, 2' to 3', Je., per., yel.

Other Species :—

aduncus, 6" to 9", Je., per., ro. pur.
alpinus, sum., bl. pur.
arenarius, 6", Je., bl.
austriacus, My., per., bl., pur.
canadensis, 2' to 3', Jy., per., yel.
Cicer, Jy., ann., yel.
dahuricus, 1' to 2', Jy., per., pur.
falcatus, 1' to 2', Je., per., grn., yel. (syn. virescens).
galegaeformis, 3' to 5', Je., per., grn., yel.
Glaux, Je., ann., pur.
Glycyphylus, 2' to 3', Je., per., pale yel.
leucophyllus, 2' to 3', Jy., per., yel.
narbonensis, 2' to 3', Je., per., yel.
odoratus, 6", Je., yel.
Onobrychis, 1½', Je., pur.
— alpinus, 1', Je., wh.
pannosus, 6" to 9", Jy., per., ro.
ponticus, 2', Jy., per., yel.
purpureus, 3" to 6", Je., per., bl.
sulcatus, 2' to 3', Jy., vio., wh.
vaginatus, 1', sum., ro. pur.
vesicarius, 6" to 9", Jy., per., pur., yel., wh.
vimineus, 6" to 1', Je., pur., ro.
virescens (see falcatus).

ASTRANTIA.

Description.—Hardy, herbaceous perennials (*ord.* Umbelliferae) of distinct appearance and considerable decorative value.

Propagation.—By division of the roots in winter or spring.

Soil.—Good garden soil.

Other Cultural Points.—Astrantias are excellent subjects for banks and woodlands, as well as the herbaceous border. They will grow nearly anywhere, although they prefer damp positions. The only attention they require is an occasional lifting

and splitting up of the clumps when these get too large, and periodical top-dressings of fresh soil.

Principal Species :—

carniolica, 1', My., wh. helleborifolia, 2', Jy., pk.

Other Species and Varieties :—

Biebersteini, 2', My. major, 2', Je., stripe l.
heterophylla (see helle- — carinthiaca.
borifolia). — variegata.
intermedia, 6", Jy., pk., minor, 6", Je., pk.
a form of major. pauciflora, 6", Jy., wh.

ASTROCARYUM.

Stove Palms (*ord.* Palmæ) of ornamental presence and easy culture. The leaves are usually silvery on the under surface. Some of the species are very spiny, and need careful handling, as the spines are of a poisonous nature. Plenty of water is necessary at all times. Propagated by seeds sown in brisk heat; occasionally by suckers. Three parts good loam, and one part cow manure, suit.

Principal Species :—

Malybo, foliage grn., with Murumuru, 40', foliage
silver under surface. dark grn., and silvery
below.

Other Species :—

acule, 10'. Ayri, 20' to 30'. mexicanum.
aculeatum, 40'. campestre, 10'. niveum, glaucous.
argenteum (see filare. rostratum, 30'.
Malybo). granatense. vulgare, 20' to 40'.

ASTROLOMA.

Greenhouse evergreen shrubs (*ord.* Epacridaceæ), with pretty flowers, propagated by cuttings of young shoots under a bell-glass in a frame. Soil, sand, loam, and peat, in equal parts. Plenty of drainage is necessary.

Principal Species :—

denticulatum, 1', My. to humifusum, 1', My., Je.,
Jy., red. sc.

ASYSTASIA.

A genus of stove evergreen shrubs or climbers (*ord.* Acanthaceæ), with funnel-shaped flowers borne in terminal clusters. Propagated by cuttings of the young shoots placed under a bell-glass, in spring, with bottom heat. Equal proportions of peat and loam, with sand, suit.

Principal Species :—

chelonioides, 3½', sum., scandens, 6', climber, Jy.,
red. pur. cream (syn. Henfreyæ
coromandeliana, 4', Jy., scandens).
macrophylla, 8' to 20', violacea, 1' to 2'.
Je., ro. pur.

ATALANTIA.

A genus of about ten species of stove evergreen foliage shrubs (*ord.* Rutaceæ). Monophylla, 8', June, white, is the only one met with. It may be increased by cuttings of the ripened shoots placed in sand under a bell-glass in brisk bottom heat.

ATHAMANTA.

Greenhouse or hardy herbaceous plants (*ord.* Umbelliferae). Matthioli, 1' to 2', summer, hardy, white, is the only one generally met with in cultivation. Its foliage is much like that of Fennel. It may be increased by seeds, and by division in spring, and will grow in ordinary garden soil.

Astranthus (see *Homalium*).

Astrapea (see *Dombeya*).

Astrolobium (see *Ornithopus*).

Astrophytum (see *Echinocactus*).

Ataccia (see *Tacca*).

Atamaseo Lily (see *Zephyranthes*).

Atelandra (see *Hemigenia*).

ATHANASIA.

Greenhouse evergreen shrubs (*ord.* Compositæ), with yellow flowers, natives of the Cape. They may be propagated by cuttings of the half-ripened shoots in spring, and do well in a compost of three parts of loam and one part of peat.

Principal Species :—

capitata, 1½', Mch. pubescens, 6', Jy.

Other Species :—

crenata, 2', Jy. longifolia, 2', Jy.
crithmifolia, 2' to 3', Jy., parviflora, 2', Ap.
wh. pectinata, 1½', Jy.
cuneiformis, 2', Jy. pinnata, 1½', Jy.
dentata, 1½', Jy. tomentosa, 2', My.
filiformis, 2', Aug.

ATHEROSPERMA.

A small genus (*ord.* Monimiaceæ). *Moschatum*, 40', June, greenhouse, white, much resembles a Conifer in general appearance. It is propagated by cuttings under a bell-glass, in sandy soil. Soil, loam and peat in equal quantities.

ATHRIXIA.

A genus of several species (*ord.* Compositæ). *Capensis*, 3', April, greenhouse, crimson, is propagated by cuttings of the young wood under a bell-glass, whilst the plants succeed under the same treatment as that given to the Cape Heaths (*Ericas*).

ATHROTAXIS.

Evergreen trees or shrubs (*ord.* Coniferæ), natives of Tasmania. They are of no special decorative value, and are safe out of doors in this country only in very sheltered positions. Propagated by cuttings under a hand-glass in a cold frame. Soil, good loam, with a little leaf soil and sand.

Principal Species :—

cupressoides, 30', foliage imbricata (*see* selagin-
grm., branches numerous oides).
and slender. laxifolia, 20' to 25' (*syn.*
doniana (*see* laxifolia). doniana).
gunneana. selaginoides, 30' to 40'.

ATHYRIUM (see ASPLENIUM).**ATRAGENE.**

Hardy, deciduous, climbing shrubs (*ord.* Ranunculaceæ), differing from *Clematis* in the flowers having petals, but now referred to that genus. Propagated by cuttings in light, sandy soil under a hand-glass, by layers put down in autumn (both cuttings and layers root very slowly), and by seeds sown in gentle heat in spring; this is the best of the three methods. Good garden soil, well worked, and inclining to be light and rich, suits.

Principal Species :—

alpina, My., bl. Alba is a pretty wh. form (*syns.* austriaca *Clematis alpina*).

Other Species :—

americana, My., pur. bl. occidentalis, Jy. (*syn.* Cle-
(*syn.* *Clematis macrophylla*). matis *macrophylla*).
laxifolia (*see* alpina). sibirica (*see* alpina).
austriaca (*see* alpina). zeylanica (*syn.* *Naravelia*
macropetala, bl. (*syn.* *Cle-* zeylanica).
matis *macropetala*).

ATRIPLEX. (THE ORACH.)

Hardy annuals (*ord.* Chenopodiaceæ) of little horticultural value, except in a couple of instances. Propagated by seeds, and thriving in any good garden soil.

Athalia (*see* Turnip *Savoy*).

Atheropogon (*see* *Bouteloua*).

Principal Species :—

hortensis, 4', sum. The leaves of this plant make a fair substitute for Spinach if gathered young.
— *rubra*, 4' to 5', sum., pur., flowers and foliage vinous red.

ATROPA.

Herbaceous perennials, distinguished by the leafy persistent calyx (*Belladonna*, *Dwale*, *Deadly Nightshade*, *ord.* *Solanaceæ*), of no decorative value. A decoction from *A. Belladonna* is used in affections of the eye to dilate the pupil. Propagated by seeds. The plants will grow in any garden soil.

Principal Species :—

Belladonna, 2' to 4', sum., grn., pur., berries blk., as large as a Cherry, poisonous. The plant is very rare in its wild state, and chiefly affects rubbish heaps and waste ground.

ATTALEA.

Stove Palms (*ord.* *Palmæ*), distinct from other Palms by the pinnæ being set in nearly vertically instead of horizontally. Propagated by seeds, and thriving in good loam three parts, cow manure one part, and sand.

Principal Species :—

Cohune, 50', fronds dark speciosa, 70
grn.

Other Species :—

amygdalina. humilis, 10.
compta, 22'. nucifera (*see* amygdalina).
excelsa, 90'. Rossii, 20'.
funifera, 40'.

AUBRIETIA.

Description.—Charming hardy rock or border plants (*ord.* *Cruciferæ*), of trailing habit, and indispensable to the flower garden in spring. They are valued for spring beds and borders in association with Arabises, Alyssums, Violas, Wallflowers, etc. They are also prized for edgings and rock gardens, where they present a fine effect trailing over the stones.

Propagation.—By division after flowering, by cuttings removed at the same time and struck in light soil under glass, or by seeds sown in spring. Some growers make layers of the best varieties.

Soil.—A light, sandy or peaty soil is the most suitable for the *Aubrietias*, but they can be grown in ordinary garden soil.

Other Cultural Points.—Seeds sown in spring will produce plants to bloom the following spring, but more profusely the second year. Old plants may be cut back immediately after blooming. This makes the plants more compact without injuring them for flowering in the following spring. All the *Aubrietias* prefer a sunny situation.

Principal Species and Varieties :—

deltoides, 4', spr., pur. There are many varieties of this species, which is the best of those in cultivation. Some of these surpass the type in beauty. *Leichtlinii* has red flowers, rather deeper than those of *rosea*. *Campbellii* is very beautiful, and has deep violet flowers. *Grandiflora* and *Hendersoni* resemble it, if they are not identical; *græca* in several forms is also good. New varieties, all worth growing, are *Souvenir de Wm. Ingram*, *Fire King*, and *Royal Purple*.

Other Species and Varieties :—

Columnæ, a var. of deltoides. libanotica, 4'', Ap., lil.
Pinardii, 3'', Ap., lil.
croatica, 4'', Ap., pur. tauricola, 2'', My., pur.

Aubergine (*Solanum Melongena*; *see* *Egg Plant*).

AUCUBA.

Description.—Favourite ornamental hardy evergreen shrubs (*ord.* Cornaceæ) of great value in the garden or shrubbery. The variegated leaves show much variety of markings, and the best forms are very beautiful.

Propagation.—By seeds sown when ripe, or by cuttings in sandy soil in autumn or spring. The latter may be struck in the open, but it is well to have some covering at hand in case of severe weather. Aucubas make good town plants, and may also be grown as pot plants.

Soil.—Any common soil will grow them in the open, but for pots one of a more sandy character should be used.

Other Cultural Points.—If berries are wanted, it is necessary to grow both male and female plants, and to ensure a good crop the female flowers ought to be fertilised with pollen from the male plants when the pistil appears to be viscid or sticky. If the pollen is ready before the pistil is sufficiently advanced, it may be kept for some time in a dry place without losing its potency.

Principal Species and Varieties :—

japonica, 10', or less. There are many vars. in cultivation, and it is preferable for a purchaser to select for himself in the nursery. The following are worth growing :—

albo-variegata.	longifolia.	pygmaea sulphurea.
aurea.	maculata.	vera nana.
fructu-albo.	maculata masculina.	viridis.
limbata.	linea.	

Other Species :—

chinensis. himalaica.

AUDIBERTIA.

Hardy evergreens (*ord.* Labiatæ) of no particular garden value. Propagation is by seeds, and ordinary garden soil suits.

Principal Species :—

incana, 1½', Aug., bl. polystachya, 2', Oct., wh.

AUDOUINIA.

A genus of one species (*ord.* Bruniaceæ). *Capitata*, 1', May, purple, is a greenhouse shrub. Propagated by cuttings of ripened shoots in sand in a cold frame. Soil, fibrous loam and leaf mould, with sand.

AULAX.

Evergreen greenhouse shrubs (*ord.* Proteaceæ), natives of the Cape, propagated by cuttings of ripened shoots in sandy soil, under a bell-glass in a cold frame. Soil, loam and leaf soil in equal parts, with sand.

Principal Species :—

pinifolia, 2', Jy., yel. umbellata, 2', Je., yel.

AURICULA.

Description.—Exquisite spring-flowering plants (*ord.* Primulaceæ), of the highest order of excellence for the garden, or for flowering in frames or Auricula houses. While all are hardy, what are known as the Show Auriculas should be grown under glass, as the meal-like dust on the blooms and leaves is spoiled by rain, and one of their charms thus greatly defaced. These Show Auriculas are divided into Green-edged, Grey-edged, Self, and White-edged varieties. The "Rules for Judging" of the Royal Horticultural Society give the leading points of all the sections in a succinct way, and a summary of these gives the needed information regarding their qualities. The corolla must be round, smooth on the edge, and perfectly flat; the tube

yellow or lemon, round, filled with the anthers, hiding the stigma from view. The paste, which comes next to the tube, should be solid and pure white. The ground or body colour ought to be dense, forming a perfect circle round the paste; while the edge should be green, grey, white, or unshaded self-colour. The stem must also be long enough and strong enough to carry the truss well above the leaves. The Alpines are to be judged differently, but it may be noted that the centre must be yellow, cream, or white, and without any farina, and the edge a zone of some dark colour, shading off to a paler tint towards the margin. Although the Alpine Auriculas are hardy enough, there is little



Photo: Cassell & Company, Ltd.

AURICULA MRS. H. TURNER (ALPINE). (See p. 95).

doubt that they come to greater perfection when cultivated in frames.

It is gratifying to find that Auriculas are again growing in favour. For many years they were largely grown by great numbers throughout the kingdom, but afterwards, and until recently, their cultivation was only maintained by a few enthusiasts.

Propagation.—New varieties are raised from seeds, which are generally the produce of plants carefully cross-fertilised with the pollen of other flowers of the highest quality. Specialists consider that it is undesirable to cross-fertilise plants belonging to a different class, *i.e.* a white-edged variety with a green-edge, and so on. The precaution of removing the anthers from the

Aulacophyllum (see *Zamia*).



Photo: Cassell & Company, Ltd.

AURICULA LORD DUDLEY (ALPINE).

seed-bearer before expansion ought to be taken, so as to prevent self-fertilisation. The resulting seeds are sown as soon as ripe, or at the beginning of March. The soil in the pots ought to be of a rather sandy nature. The seeds must be very lightly covered with light, fine soil, and the pots afterwards placed in a rather close frame, where they may remain, covered with a sheet of paper, until the seeds germinate, when light and air should be given gradually. When strong enough they must be pricked out separately, and afterwards placed in small pots singly, and grown on until their value can be proved. Named or meritorious varieties are propagated by offsets, taken off as near the middle of February as possible, or, at least, when top-dressing. The offsets are put round the edges of small pots, and kept rather close under glass until they have rooted properly. If the top of the old plant is taken off and struck in a pot, other suckers will probably be produced.

Soil.—Modern growers adopt a much simpler compost than those of many years ago, who concocted wonderful compounds in which to grow their plants. Auriculas are healthier with a simple compost, composed of old loam of a fibrous nature, made from good turf which has been cut and stored in a heap for about a year; well-decayed cow manure, leaf mould, and some coarse sand, with a little charcoal. A proportion of about four parts loam to one part each of the manure, leaf mould, and sand will answer, with a little of

the other ingredients. They must, as a matter of course, be properly mixed. A similar soil will suit the Alpine Auriculas, but their requirements are not so exacting, and they can be grown in ordinary garden mould.

Other Cultural Points.—Repotting Auriculas is done as soon after flowering as possible, though it may be necessary to delay it if seed-saving is followed. May and up to the end of June is, perhaps, the best period in which to perform this operation. Many plants have been grown in 6" pots, but the size most generally used now is 5". The pots must be well drained, and on the crocks should be placed some of the more fibrous portions of the soil, with a little charcoal or leaf mould. In repotting, shake off part of the old soil and trim in the roots slightly. Firm potting is not needed for the Auricula, yet it must not be too loosely put into the soil. After potting, place the plants in their summer frames, keeping them close and rather dry for a few days. Frames for the Auricula in summer ought to face to the north, but the plants should be in frames or houses, with a south exposure, from the beginning of November to the end of April. The frames should be of sufficient height to allow of a small stage on which to stand the pots. A low span-roof house, with a little heat in spring, is found useful by those who compete at the early shows. Watering and giving air are two important things in cultivating these fine flowers. They need good supplies when growing, but in winter little water is needed.

Enemies.—The pests which trouble the Auricula



Photo: Cassell & Company, Ltd.

AURICULA REV. F. D. HORNER (GREEN-EDGE).

grower are usually aphides or green fly, and a louse which infests the collar and roots. The former can be removed by fumigating carefully or by dipping the plants in a preparation of a good insecticide; while the latter must be exterminated by taking the plants out of the pots and washing them with a solution of soft soap.

A Selection of Varieties.—There are so many good florists' Auriculas in cultivation that it is with difficulty that a selection of moderate numbers can be given. Those named below will form the nucleus of a good collection, which can be added to by exchange or otherwise as opportunity offers. Many of the newest varieties are not in commerce.

Green-Edged.—Abbé Liszt, General Neill (Traill), John Garrett (Adams), Prince of Greens (Traill), Rev. F. D. Horner (Simonite), and Shirley Hibberd (Simonite).

Grey-Edged.—Colonel Champneys (Turner), George Ruidl (Woodhead), Highland Mary (Low), Mabel (Douglas), Richard Headley (Lightbody), Silvia (Douglas).

White-Edged.—Acme (Read), Dr. Kidd (Douglas), Heather Bell (Simonite), Mrs. Dodwell (Woodhead), and Reliance (Mellor).

Self.—Black Bess (Woodhead), Buttercup (Horner), Rev. Charles Kingsley (Douglas), Ruby (Simonite), Sapphire (Horner), and Vulcan (Sims).

Alpinex.—Dean Hole (Turner), Defiance (Turner), Diadem (Gorton), Duke of York (Douglas), Edith Lodge (Douglas), Evelyn Phillips (Phillips), Friendship (Douglas), George Lightbody (Turner), John Beswick (Turner), Lord Dudley (Douglas), Mrs. Harry Turner (Turner), Mrs. Patrick Campbell (Douglas), Sam Barlow (Turner).

Border Varieties.—Some very beautiful Auriculas can be raised from purchased seeds, but a few named varieties are given for those who wish to have such:—

Celtic King, *yel.*; Dusty Miller, *yel.*; Grace Darling, *vio.*; John Dalton, *pur.*; Yellow Queen, *yel.*; and Old Double Yellow, a scarce old plant. Queen Victoria and other of Storrie's seedlings are fine border plants.

AVENA.

A genus of Grasses (*ord.* Gramineæ), of which the well known cereal the Oat is the chief member. Sterilis, the animated Oat, is remarkable for the length of its awns, which possess hygrometric properties. $1\frac{1}{2}$ ' to 2', hardy. Propagation by seeds, in ordinary garden soil.

AVENUE.

A path or carriage drive bordered on each side by a row of trees. When the trees are well planted and properly cared for an avenue is a most effective feature, either in a public or private park. The width of the path or carriage way will depend upon individual taste. Where Sequoias and other Conifers of pyramidal habit are planted it may be as little as 20', but where Limes, Elms, Oaks, or other forest trees are favoured the width must be proportionately greater, to allow of the spread of the branches in the full-grown trees. As a rule a bold curve is an excellent idea to aim at, but even the much decried straight line is not to be despised. In any case, a winding design with many sharp curves should be avoided.

The Horse Chestnut makes a splendid avenue tree, witness the far-famed Chestnut Avenue at

Bushey Park. The trees are especially handsome, both when in flower and when clad in their autumn tints. The Spanish or Sweet Chestnut is another capital subject, but in most places the trees do not make such fine heads as the Horse Chestnut.

Oaks are very imposing, but slow-growing, and thus, where the planter wishes to see some of the results of his labours, they are not to be thought of.

Limes are great favourites by reason of their compact and graceful habit. The White Poplar is a quick growing and hardy tree, suitable for wet, clayey soils. The Cedar of Lebanon (*Cedrus Libani*) is very stately, although it is not so graceful as its relative the Deodar (*C. Deodara*). Elms have acquired an unenviable notoriety for being dangerous on account of their falling limbs, but this is an instance where the skill of the forester should be applied. There is no tree that boasts a more graceful growth than the Elm. *Cryptomeria elegans* and *Araucaria imbricata* are both suitable, and the False Acacia, *Robinia Pseudacacia*, is a far better avenue tree than many people imagine. Either single or double rows may be planted. If double rows they should form a series of triangles. Irregular clumps of dwarf shrubs should be introduced here and there to break the monotony of the lines and to obviate the suggestion of bareness.

AVERRHOA.

Stove shrubs (*ord.* Geraniaceæ) of no great value. Propagated by cuttings of firm side shoots in sand, in brisk bottom heat. Soil, equal parts of loam and peat with sand.

Principal Species:—

Bilimbi, 8' to 10', My.	Carambola—the Caram-
red pur. (Cucumber	bola Tree—14' to 20',
Tree.)	reil.

AVERRUNCATORS.

Pruning shears of a peculiar pattern, mounted upon a pole of varying length. The cutting blade works into a hook-shaped sheath by which the branch which is to be removed is grasped. The power is applied by means of a small lever handle at the bottom of the pole, and transmitted from the lever to a stout wire which runs from the lever to the cutting blade. This wire is secured in its place by a number of strong iron "eyes." The tool is handy for the removal of branches that would otherwise be out of reach, and the larger makes are equal to the negotiation of fairly thick wood, but the cut made is naturally attended with a good deal of bruising and crushing, and the contrivance is not to be recommended for general pruning purposes.

AYENIA.

Stove plants (*ord.* Sterculiaceæ) of no particular value. Two species (*laevigata*, 2', scarlet, evergreen, and *pusilla*, 1', August, purple) are occasionally met with. They are propagated by cuttings, and thrive in a mixture of three parts of loam, one part of peat, one part of decayed manure, and some sand.

AZALEA.

A genus (*ord.* Ericaceæ) comprising some of the most popular of greenhouse and hardy plants,

Arens (see *Geum*).

Avocado (see *Persea*).

Azaleastrum (see *Rhododendron*).

referred to the genus *Rhododendron* by some authorities, but generally kept distinct for garden purposes. The so-called Indian Azaleas, mostly varieties of the species *indica*, are exceedingly beautiful greenhouse plants, and are imported largely from Belgium. Amongst hardy Azaleas there are the Ghent or American, *pontica* (note that this is not *Rhododendron ponticum*), and other varieties. Notes on culture and selections of varieties are given in the case of the principal sections. There are many species of Azaleas, but they are in the main of little horticultural value as compared with the varieties, and therefore only a summary of them is given.

Description of the Indian Azaleas.—All the greenhouse Azaleas are evergreen, and their culture is chiefly confined to varieties of garden origin. At the time when trained specimen plants were much in vogue Azaleas were largely grown for this purpose, trained in pyramid and other shapes. For the decoration of conservatories, and for providing cut flowers, Azaleas are extremely useful. A cool greenhouse temperature suits them, and they may be grown in a cold frame or outdoors during the summer.

Propagation.—By seeds, cuttings, and grafting. Seeds should be sown in a gentle heat in February, in shallow pans. When the seedlings have made a few leaves, prick them off in other pans filled with sandy peat. The following spring they may be transferred to small pots. To propagate from cuttings, select young, half-ripened shoots from plants that have flowered. Slip them off with a heel, trim the base, and insert half a dozen in a 6" pot three parts filled with sandy peat, with a layer of silver sand on the surface. Cover the receptacle with a bell-glass, stand it in a temperature of from 60° to 65°, and shade from hot sunshine. When the cuttings are rooted, transfer them to small pots, using fine peat and sand. Keep them in a warm temperature till roots are in action, when they may be removed to the greenhouse. Pinch out the points to cause side shoots to break, and pot on as required. Grafting is an excellent means of propagation. The early spring is the most suitable time, and *indica alba* and *pontica* are good stocks. The scions should be about 1½" long, and be sidegrafted on to the stocks, and fastened with worsted. Until scion and stock are united the grafted plants should be grown in a warm propagating frame.

Soil.—Three parts of fibrous peat, one part of loam, and one-fourth part of silver sand.

Other Cultural Points.—The best time for repotting established plants is directly the flowers have faded. Prior to the operation pick off all the seed pods. The balls, when turned out of the pots, resemble a mass of fibrous roots. In the case of growing specimens, provide pots one or two sizes larger. Full-grown plants may be replaced in the same size pots. To reduce the balls take a sharp knife and pare them round sufficiently to afford room for the new compost. Drain the pots carefully, and press the soil evenly and firmly round with a blunt stick, leaving only a slight covering of the new material over the old ball. Leave sufficient room in the pots for holding water, as plants are liable to die after potting through the old ball getting dry in the centre. Shade for a few weeks after potting, and syringe frequently. A warm greenhouse temperature suits Azaleas after flowering. Syringe daily while new growth

is being completed. Harden the growth by exposure to sunshine. About the middle of June the plants may be placed in a cold pit or stood outdoors, preferably in a western aspect. Stand the pots on a layer of coal ashes, or plunge them in Cocoanut fibre refuse. At all times Azaleas must be carefully watered, endeavouring to keep the soil in an even state of moisture. If the compost becomes sour through over-watering and bad drainage, the results are often fatal, and drought at the roots is equally injurious. If a plant gets very dry, the best way to ensure a thorough soaking is to sink the pot for twenty minutes in a pail of water. Towards the end of September the plants should be removed to a light, airy greenhouse for the winter. Azaleas are very useful for providing cut flowers, and free-growing varieties may be cut without injuring the plant.



AN AZALEA GROWN BY AN AMATEUR.

A Selection of Varieties.—There are many varieties in cultivation, including single, semi-double, and double forms, and varying widely in size of flower, and colour. The following is a good selection:—

SINGLES.

Apollo, wh., striped car.
Baronne de Vrière, wh.,
crim.
Charmer, amaranth.
Comtesse de Beaufort,
ro., blotched crim.
Fielder's White, wh.
Madame Jean Nuytens
Verschaffelt, wh., spotted
yel.
Mlle. Leonie Van Houtte,
wh., flaked ro., large.
Mrs. Turner, pk., edged
wh.
Reine des Fleurs, salmon,
edged wh.
Sigismund Rucker, ro.,
edged wh.
Stella, or. sc., fine.
Theodorus, fiery red.

DOUBLES.

Alice, deep ro., blotched.
Bernard Andre, vio. pur.
Deutsche Perle, wh.,
early.
Empress of India, salmon,
wh.
Grand Duchesse de Baden,
rosy sc., semi-double.
Louise Margottin, wh.
striped, semi-double.
Madame Van der Cruys-
sen, ro., dark spots,
semi-double.
Phœbus, ro., semi-double.
President Oswald de Ker-
chove, salmon pk., fine.
Reine du Portugal, wh.
Souvenir de Prince Albert,
rosy peach, wh. mar-
gin.
vervœneana, salmon,
wh. margin, fine.

Enemies.—Green fly is a source of trouble when plants are making new growth, and may be kept in check by fumigating. A far worse pest is thrips, which causes the leaves to assume a sickly appearance and fall. Frequent syringings with clear water form the best preventive, taking care to wet the under as well as the upper side of the leaves. Thrips may be checked under glass by fumigating with a vaporising compound, and outdoor plants should be dipped in or syringed with some approved insecticide. A simple remedy is 1 oz. of shag tobacco and 2 oz. of soft soap, boiled in 1 gallon of water, and strained and stirred before being used, but Nicotine Soap is excellent.

Description of the Hardy Azaleas.—These plants comprise a number of deciduous species, but the chief interest lies in the beautiful Ghent Azaleas, most of which are seedling varieties obtained from the principal species. There are many beautiful hybrids between mollis and sinensis.

Propagation.—By layers, seeds, cuttings, and by grafting. Layers should be notched or twisted, buried in the soil, and pegged down in March. They should not be detached from the parent till the second year's growth. Varieties are raised from seeds sown in April in boxes filled with fine peat and sand, and placed under a cold frame. The following year prick off the seedlings 6" apart in a bed of peaty soil. Cuttings are formed of young, half ripened shoots inserted in a frame in August, and protected through the winter. To increase varieties by grafting, pontica makes a good stock.

Soil.—Sandy peat is excellent, but hardy Azaleas will thrive in fairly dry situations where the soil contains a good proportion of sand and leaf mould. In order to grow them where the rooting medium is stiff and retentive, it is advisable to remove a portion of the soil and make up beds of rough, sandy peat and leaf mould, or good loam free from lime, from 12" to 18" deep.

Other Cultural Points.—When established in suitable soil, hardy Azaleas will develop into fine specimens, and no flowers are more effective in the early summer. When grown in low situations the young early shoots are sometimes destroyed by late frosts, and to obviate this it is necessary to afford some means of protection. To facilitate the growth of young plants it is advisable to pick off the seed pods as soon as the flowers have fallen. Mollis and its varieties are much in demand for forcing, and large numbers of plants are imported from the Continent annually for this purpose. Forcing may commence in October and be continued till March. After flowering under glass the plants should be kept indoors to finish their growth, and then be gradually hardened and planted out. They may be forced again in two or three years.

A Selection of Ghent Azaleas :—

Admiral de Ruyter, red.	Madame Thibaut, cream.
Comte de Flandres, car.	Marie Verschaffelt, pale ro.
Daviesii, wh.	ro.
Grand Monarque, salmon pk.	Unique, yel.

A Selection of mollis Azaleas :

Alphonse Lavallée, or.	Madame C. L. D'Hanis, salmon pk.
Consul Pecher, pk.	M. A. de Warelles, car.

Beautiful Hybrids of mollis and sinensis :—

Alma Tadema, pk.	Glory of Boskoop, or.
Anthony Koster, yel.	Sebastopol, light red.

Summary of Azalea Species :—

amœna, 1', crim., pur. By crossing this with indica a fine series of hybrids has been raised.

calendulacea, 2' to 6', yel., red, or. A handsome shr. There are several varieties in cultivation.

indica, 3' to 6', sc. A large number of grh. sorts have been obtained from this.

mollis, 3' to 4'. There are numerous varieties of this well-known species. It is distinct from mollis (Rhododendron molle) of Blume, which is synonymous with sinensis.

nudiflora, 3' to 4'. A large number of varieties have been obtained by crossing this species with calendulacea, pontica, viscosa, and others.

pontica, 4' to 6', yel. There are many beautiful varieties of this species.

speciosa, 3' to 4', sc., or. The varieties vary in colour, and shape of leaf.

viscosa, 2' to 4', wh., sweet scented. The varieties of this species are numerous.

AZARA.

Fine hardy or half-hardy shrubs (*ord.* Bixineæ) of evergreen habit, and bearing sweetly scented flowers. They look well on walls, but show their habit better when grown as bushes. They are increased by cuttings struck in sandy soil under glass with a little bottom heat, and succeed in loam, leaf mould, and sand. In cold localities it may be necessary to give the plants a little protection. Microphylla, however, appears to be hardy almost everywhere.

Principal Species :—

Gilliesii, 15', My., yel. A very handsome shr. with pretty flowers and Holly-like leaves.

microphylla, 12', spr., greenish. Prized for its neat habit and its pretty or. coloured berries. These are very ornamental in autumn.

Other Species :—

dentata, 12', Je., yel. integrifolia, 18', Aug., yel.

AZOLLA.

Small, floating aquatic plants (*ord.* Rhizocarpeæ), of which the only one in cultivation is caroliniana, an attractive Fern-like little plant which hardly rises above the surface of the water and covers it with a carpet of green, which changes in summer to a bronze colour. It is perfectly hardy, and may be grown in still water outside, or in a basin or aquarium indoors. The Azolla makes a beautiful microscopic object. It increases rapidly, and needs no care beyond placing it on the surface of shallow water at first, with the root fibres downward. It requires no soil.

BABIANA.

Description.—Highly ornamental bulbous plants (*ord.* Iridæ) which are very pleasing in the garden, or in pots for conservatory or window decoration. They resemble the Ixias, and grow from 6" to 9" high, producing spikes of richly coloured flowers and dark green, hairy leaves.

Propagation.—By offsets, taken off when the plants are at rest, and afterwards grown on in good soil until large enough to flower. Also by seeds sown in pots and pans, and placed under glass in a slight heat. They may be sown when ripe, or later, and the seedlings grown on as in the case of the small offsets.

Soil.—A light, sandy soil, enriched with decayed manure, is best.

Other Cultural Points.—Pot culture is most satisfactory; but Babianas may also be grown in

sunny places in the garden, in light, well-drained soil. If planted in autumn, they will need protection with straw or other litter, or cocoanut fibre. Plant the corms with the crown 3" below the surface. Remove the covering in March. For pots plant from October to January in 4" pots, using five bulbs to a pot, or more if a larger size is used. Loam, leaf soil, and silver sand form a good compost. Plunge the pots in ashes in a cold frame, and give no water until some growth is made. When they have made growth they may be removed to the greenhouse, or where they are to bloom. Give plenty of air and water when growing.

Principal Species :—

[*Note.*—For ordinary purposes mixed Babianas,



BAHIANA STRICTA.

which can be bought from the bulb dealer, are quite good enough.]

disticha, 6", Je., Jy., bl. A pretty, fragrant species, close to *plicata*, and described as a var. of it by some botanists.

ringens, 8", Je., sc. A very handsome and effective plant.

stricta, 9", My., wh., bl. A valuable species (*see figure*), of which there are several vars, *e.g.* *angustifolia*, bl.; *rubro-cyanea*, bl., crim.; *sulphurea*, pale yel.; and *villosa*, crim.

Other Species :—

plicata, 6", Je., bl. *socotrana*, 4", Sep., bl.
sambucina, 9", My., pur. *tenuiflora*, 6", Je., pur.

BABINGTONIA.

A genus of pretty evergreen greenhouse shrubs (*ord.* Myrtaceæ), very close to Bæckea, indeed included in that genus by some botanists. Increased by cuttings of the tips of the young shoots, placed under a bell-glass and kept close. Equal parts of loam and peat, with a little sand, suit. Pinching must be resorted to in order to induce a bushy and free-flowering habit. If this little attention is not given the plants are apt to be very straggling and to bear but few flowers. Slight shade is necessary during the summer months, but Babingtonias must never be coddled.

Principal Species :—

Camphorosmæ, 7', sum., grh., pk., wh.

BACCHARIS (*syn.* MOLINA).

Hardy, greenhouse, or stove shrubs or herbs (*ord.* Compositæ), of no particular horticultural value. They are of very easy cultivation. Cuttings of the young shoots strike in spring if placed in a propagating frame. Two parts of good loam, one part of leaf soil, and a little sand, are suitable.

Principal Species :—

halimifolia, Groundsel Tree, 6' to 12', Jy., hdy., wh.

Other Species :—

alata, 5', Dec., grh., yel. *glutinosa*, 3', Aug., st., wh.
conferta, Jy., wh. *marginalis*, 3', Jy., wh.

BACHELOR'S BUTTONS (*see* RANUNCULUS ACRIIS FL. PL., and ACONITIFOLIA FL. PL.)

BACKHOUSIA.

Evergreen greenhouse shrubs (*ord.* Myrtaceæ), propagated by cuttings of the half ripened shoots taken in April and struck in sand under a bell-glass in a temperature of 55°. Equal portions of fibrous loam and peat, with sand, will make a suitable compost. *Myrtifolia*, 10' to 16', May, white, is a pretty greenhouse plant.

BACTRIS.

Handsome stove Palms (*ord.* Palmæ), of prickly growth and rather slender habit. From the gardener's point of view the plants are of the greatest value when young, as then they are most ornamental. They are increased by suckers, which are thrown up very freely from the healthy older plants; also by seeds, which are not easy to obtain. Two-thirds of fibrous loam, and one-third of well-rotted cow manure, suit. The plants revel in heat and the free use of the syringe.

Principal Species :—

caryotefolia, 30'. *pallidispina*, leaves very spiny (*syn.* *flavisпина*).

Other Species :—

baculifera, 30'. *major*, 25'.
cuspidata, 20'. *Maraja*, *Maraja Palm*,
flavisпина (*see pallidis-* 30' to 50'.
pina). *pectinata*, 15'.

BÆCKEA.

Greenhouse evergreen shrubs (*ord.* Myrtaceæ) of no great value. Propagated by cuttings of tips of the young shoots, taken in spring, and rooted beneath a bell-glass in a cool frame. Loam, leaf soil, and sandy peat, in equal parts, suit.

Principal Species :—

diosmifolia, 1' to 2', Aug. to Oct., grh., wh.

Bacazia (*see* Barnadesia).

Badger's Bane (*see* *Aconitum meloctonum*).

Other Species :—

<i>densifolia</i> , 3',	<i>parvula</i> , 1', Aug., grh.,
<i>frutescens</i> , 2½', Nov., grh.,	wh.
wh.	<i>virgata</i> , 2½', Aug. to Oct.,
<i>gracilis</i> , 2', grh.	grh., wh.

BÆRIA.

An obscure genus (*ord.* Compositæ) of about nineteen species, one only of which—*chrysostoma*, 1', summer, hardy, yellow—is ever seen. Increased by seeds sown in spring. The plants thrive in any ordinary garden soil.

BAHIA.

Hardy herbaceous perennials (*ord.* Compositæ). The species *lanata*, 6" to 15", summer, hardy, yellow, likes a well-drained sandy soil. It may be increased by seeds, and also by root division in spring.

BALBISIA (*syn.* LEDOCARPON).

A genus of very ornamental evergreen shrubs (*ord.* Geraniaceæ). *Vorticillata*, 3' to 6', autumn, greenhouse, yellow (*syn.* *Ledocarpum pedunculare*, Lind), may be propagated by cuttings of fairly firm shoots under a bell-glass, and also by seeds. It is impatient of stagnant moisture at the roots, and is not easy to grow.

BALCONY.

An appurtenance to the side or front of a house, generally surrounded with a balustrade or railings, which serve as support for climbers. *Nasturtiums*, *Convolvulus*, *Passion Flowers*, *Sweet Peas*, etc., are suitable. The sides of the balcony should be fitted with long, narrow boxes after the style of those generally used for windows. These may be filled with evergreens in the winter, and any of the many annual, or even greenhouse, flowering plants in the summer, choosing bright and attractive subjects as much as possible. The boxes, being situated near the windows of the house, may have a fair proportion of sweet-smelling plants, such as *Mignonette*, *Heliotrope*, or sweet-scented *Tobacco*, planted in them. Neatness and cleanliness should be scrupulously observed, and great attention paid to watering, as, owing to the plants possessing such a restricted root run, any neglect with the watering can will soon have disastrous effects.

BALM.

A common perennial herb, botanically known as *Melissa officinalis*, whose leaves are possessed of a strong odour. It is sometimes used in the making of claret cup, and a "tea" made by boiling it in water is an old-fashioned remedy for colds. It will grow in any fairly good garden soil, and may be propagated by cuttings or by root divisions in spring. The variegated form is a pretty plant, whose fragrance is equal to that of the type. (See also *Melissa*.)

BALM OF GILEAD (see *CEDRONELLA TRIPHYLLA*).**BALSAM (ANNUAL).**

Description.—Half-hardy or greenhouse annuals (*ord.* Geraniaceæ), botanically known as *Impatiens Balsamina*, bearing pretty, often *Camellia*-shaped,

Beechotrys (see *Mesa*).

Bakaria of *Seeman* (see *Plerandra*).

Balaninus (see *Nut Enemies*).

Balanium (see *Dicksonia*).

flowers up the stem. There are a number of species included in the genus, but the chief interest in these flowers is centred in the many coloured strains of garden origin. The best way to grow *Balsams* is in pots in a greenhouse or conservatory, but they may be also planted out in beds in the summer.

Propagation.—From seeds sown in February and March in pans or boxes, placed in a propagating frame or warm greenhouse.

Soil.—For seeds, equal parts of loam and leaf mould, with a liberal sprinkling of sand. For growing plants, three parts loam, two parts well decayed manure, and one part leaf mould, with sufficient sand to keep the compost open.

Other Cultural Points.—Plants raised by sowing in February will flower in May and June, and by sowing again the following month a succession is obtained. When the seedlings have developed the second leaf they should be transferred to small pots, and from then to the flowering stage growth should be assisted as much as possible by repotting before the plants become root-bound, growing in a rather moist atmosphere, affording abundance of light, and avoiding overcrowding. Six-inch pots are suitable for the plants to flower in, but 8" are necessary if fine specimens are desired. *Balsams* appreciate good treatment, therefore, when flower buds are forming, feed liberally with liquid manure, and occasional dressings of some prepared fertiliser. By picking the old blooms from early flowering plants, and repotting, a succession of flowers may be had later in the season.

Enemies.—Red Spider affects plants grown in a dry atmosphere; a free use of the syringe will prevent it. Aphides are troublesome pests, and should be kept in check by fumigating.

Principal Sections :—

To secure fine flowers it is necessary to grow only the best strains, as the seeds of these are obtained from selected plants. The following are the chief sections :—

Camellia flowered, 18", producing large flowers of *Camellia* shape.

Miniature, 9", dwarf form of the above, well adapted for bedding.

Rose flowered, 18", large double flowers resembling *Roses*.

In all these sections there are distinct varieties of different colours, including white, scarlet, and lilac, some being self coloured, and others blotched and striped. Seed can be purchased in collections of separate colours, or mixed.

For species see *Impatiens*. *Balsam Apple* is *Momordica Balsamina*, *Balsam of Capevi* is *Copaifera*, *Balsam tree* is *Clusia*. For *Balsamina* see *Impatiens*.

BALSAMODENDRON.

Greenhouse or stove shrubs (*ord.* Burseraceæ) of no great decorative value. Propagation is by cuttings of matured shoots, in spring, in brisk bottom heat. Soil, sandy loam, with plenty of drainage. *Zeylanicum*, 30', summer, stove, white, now correctly referred to *Canarium*, is the only one worthy of mention.

BALTIMORA.

A genus (*ord.* Compositæ) of annual herbs with yellow flowers, of no horticultural value. *Fougeria*, *Fougerouxia*, *Nieuhuria*, *Scelospermum*, and *Timanthea* are included in its limits.

Principal Species :—

recta, 1', Jy., yel. (*syns.* alata, alba, and triner-vata).

scabra (now referred to *Calea hymenolepis*).
Scolospermum.

BAMBUSA (THE BAMBOO).

Description.—Half-hardy or hardy Grasses (*ord.* Gramineæ) of great size, with stout, hollow, and



Photo: Cassell & Company, Ltd.

BAMBUSA NAGASHIMA.

often woody stems (culms). Not only are they amongst the most decorative of plants for the outdoor garden, but economically considered they are amongst the most important of plants. The variety of purposes to which Bamboos are put in India, China, and Japan is amazing; whilst in our own country, Bamboo furniture has of late years been very much sought after. The smaller shoots are shipped in great quantities to serve as stakes to all sorts of plants requiring support.

The *Genera Plantarum* gives twenty-four distinct species, but the *Index Kewensis* records no fewer than ninety species. Many of these have only been provisionally placed under *Bambusa*, and there they will remain until they flower, and their affinities and proper botanical place can be determined. The present synonymy is according to the *Kew Hand-List*.

Propagation.—By division of the rootstock, as in *Arundinaria*. The same soil suits.

Other Cultural Points.—For cultural purposes the hints given under *Arundinaria* will serve for *Bambusa*. It will be noticed that not a few plants that were originally placed under *Bambusa* are now to be found under the closely allied genus *Arundinaria*.

Principal Species :—

arundinacea, 50' to 60', st., pale grn. foliage.

aurea, 6' to 10', half-hdy., pale grn. yel. (The *aurea* of gardens is *Phyllostachys aurea*.)

marmorea, 3' to 4', hdy., stems br., foliage pale grn.

nana, 6' to 8', st. (*syns.* *glauca* and *viridiglauescens*). (Nana of gardens [not Roxb] *see disticha*.)

palmata, 3' to 6', hdy., grn., wh. midrib (*see figure*)

pygmaea, 1½' to 2', hdy., dark grn.

tessellata (Munro), 3' to 3½', hdy., grn., makes a branching bush (*syns.* *Ragamowski* and *Arundo Ragamowski*). (*Tessellata* of gardens, *see Arundinaria Veitchii*.)

violascens (*see Phyllostachys violascens*).

Other Species :—

angustifolia, 2' to 4', hdy., pale grn.

disticha, 2½' to 3', hdy., very bushy (*syn.* *nana*, of gardens).

glauca (*see nana*).

japonica (*see Arundinaria japonica*).

Maximowiczii (*see Arundinaria auricoma* and *A. Simoni variegata*).

Metake (*see Arundinaria japonica*).

mitis, 40', hdy., deep grn. (*Mitis* of gardens [not Poir] *see Phyllostachys mitis*.)

Nagashima, 1' to 2', hdy., grn. (*see figure*).

nigra (*see Phyllostachys nigra*).

quadrangularis, 3' to 8', hdy., pale grn.

Ragamowski (*see tessellata*).

Simoni (*see Arundinaria Simoni*).

viridiglauescens (*see Phyllostachys viridiglauescens*).

viridi-striata (*see Arundinaria Simoni*).

BANANA (see MUSA).**BANISTERIA.**

Stove trees or shrubs, or shrubby climbers (*ord.* *Malpighiaceæ*), of some beauty, but rarely seen in this country. Propagation, by cuttings of the



Photo: Cassell & Company, Ltd.

BAMBUSA PALMATA.

ripened shoots, in spring, in bottom heat. A mixture of equal parts of loam, leaf soil, and peat, with sand, suits them. All the species mentioned are climbers.

Principal Species :—

chrysophylla, sum., st., or. ciliata (see Stigmaphyllon ciliatum).

Other Species :—

fulgens, st., yel. sericea, Je., st., yel.
humboldtiana (see Stigmaphyllon). splendens (see Stigmaphyllon fulgens).

BANKS.

Banks running east and west were formerly extensively used in gardens, and served a useful double purpose in assisting the early production of fruits and vegetables, such as Potatoes, Peas, and Strawberries, on their southern side; while, by assisting the retardation of subjects grown on their northern slope, they considerably prolonged the season of production. They should be 6' to 12' wide at the base, with a gentle slope upwards; if this slope be too abrupt the bulk of the rain will be thrown off. The paths below should, in any case, be well drained, as their position favours the accumulation of moisture. Grass covered banks or slopes at the ends of lawns are very effective, and if of a sufficiently gentle slope to admit of flowerbeds being formed thereon will make a very attractive feature. Banks under trees or in shady places may be rendered delightful objects by planting them with Ivy, and interspersing this freely with Snowdrops and Crocuses; while a warm, sunny bank thickly planted with Winter Aconites, Scillas, Chionodoxas, Grape Hyacinths, Snowdrops, and Crocuses, or with Violets and Primroses, will be a source of delight at a time of the year when flowers are most appreciated. Banks of this kind should have a goodly percentage of clay employed in their construction, otherwise the liability to constant crumbling away will be provocative of annoyance and untidiness.

BANKSIA.

Description.—Evergreen greenhouse shrubs (ord. Proteaceæ), whose chief decorative value lies in their foliage. In most cases the under surface of the leaves is silvery white, and this forms a striking contrast to the deep green of the upper surface. All are natives of Australia.

Propagation.—By cuttings of the ripened shoots, cut off at a joint in the usual way, but having none of the leaves removed. They should be placed in sand in a cool propagating frame. By seeds occasionally, but this is a very uncertain method of increase.

Soil.—Equal proportions of peat and loam, with plenty of sharp sand, and a few pieces of charcoal.

Other Cultural Points.—The plants require large quantities of water, and, as the roots are very strong, the drainage must be ample; fully a third of the pot should be filled with crocks. Banksias do not like heat, and although they will not stand frost they object to being coddled. If treated as suggested they are not really difficult to grow.

Principal Species :—

collina, 7', yel. (syns. grandis, 40', yel.
Cunninghamii, ledifolia, occidentalis, 5', yel.
and littoralis). speciosa, 6'.
dryandroides, 6', foliage
grn., red. br.

Other Species :—

æmula, 20' (syn. elatior). latifolia, 20'.
australis (see marginata). ledifolia (see collina).
Caley, 5' to 6'. littoralis (see collina).
Cunninghamii (see collina). macrophylla (see integrifolia).
elatior (see æmula). marginata, 5', foliage
integrifolia, 10' to 12', grn., wh.
foliage grn. and silver oleaefolia (see integrifolia).
(syns. macrophylla and quercifolia, 5'.
oleaefolia). Solandri, 6'.
— compar, 6', yel.

BAPHIA.

Stove trees (ord. Leguminosæ) of no garden value. Propagation, by leaf cuttings under a bell-glass in heat. Soil, equal parts of peat and loam. Nitida, 30', June, white, yields the camwood of commerce.

BAPTISIA.

Hardy herbaceous perennials (ord. Leguminosæ) with pretty blue or yellow flowers, but rather shy in blooming. Propagation is by division in the case of choice species and varieties; also by seed sown in pans of well-drained soil in a cold frame. The divisions make plants much more quickly when given the shelter of a frame also. Equal parts of peat and loam, with a little road scrapings or other grit, suit the pot plants; and sandy loam will do for those planted in the border.

Principal Species :—

alba, 2', Je., wh. — minor, 1½', Je., bl.
australis, 4', Je., bl. tinctoria, 2', sum., yel.
— exaltata, 3', Je., dark bl.

Other Species :—

leucophaea, 1', Jy., cream perfoliata, 2½', Aug., yel.
yel. villosa, 2', Je., yel.

BARBACENIA.

Showy herbaceous perennials (ord. Amaryllidæ) closely related to Vellozia, and thriving in stove heat. The flowers are large and of some shade of purple. It is said that they are in high favour in South American gardens on account of their ability to withstand drought and heat, but they are seldom seen in British gardens. Propagation by division of the roots. Fibrous loam and peat, with a little charcoal, suit them, and if they can be given baskets instead of pots so much the better.

Principal Species :—

purpurea, 1½', Jy., pur. squamata (see Vellozia
Rogierii, 1½', Jy., vio. squamata)

BARBAREA.

Hardy perennial herbs (ord. Cruciferae) of no decorative value, except vulgaris flore pleno. Several are natives of Britain. Propagated by root division, cuttings, suckers, and seeds. They will thrive in any garden soil, and it scarcely matters how poor it is. (See AMERICAN CRESS.)

Principal Species :—

stricta, sum., yel. — flore pleno, 1½', sum.,
vulgaris, 1½', sum., yel. yel., double.
— præcox, 1½', sum. — variegata, 1½', sum., yel.

BARBERRY (see BERBERIS).

BARBIERIA.

Stove evergreen shrubs (ord. Leguminosæ), propagated by cuttings of the partly matured shoots in strong heat, and thriving in peat, loam, and

Baobab tree (see Adansonia).

sand in equal parts. Polyphylla, summer, scarlet, is also known as *Clitorea polyphylla*, and *Galactia pinnata*.

BARK.

The exterior covering of dicotyledonous trees.

Bark-bound is a condition generally induced in a tree by too poor a rooting medium or a badly drained border. It is highly injurious to the trees affected, often causing gumming in the Peach, Cherry, and other stone fruits. The old school of gardeners were wont to slash and score their bark-bound trees with a knife, but modern opinion emphatically condemns this as barbarous and



BARKERIA ELEGANS.

ineffectual, and prescribes as a remedy the better draining and working of the soil.

Bark shedding takes place annually to a considerable extent in the Plane Tree. The lower parts of trees are often "barked" by rabbits; to prevent this the base of the tree trunk should be protected with wire netting.

Oak bark was formerly in great request as a heating and plunging material after it had been used for tanning, but has been superseded by hot-water pipes and Oak leaves or Cocoanut fibre refuse.

BARKERIA.

Description.—Epiphytic, deciduous cool-house Orchids (*ord.* Orchidaceæ) of great beauty, now included by botanists amongst the *Epidendrums*.

Propagation.—By division, just before the new growths begin to push freely.

Soil.—No soil is needed, but the plants should be firmly tied to blocks of wood or wooden rafts. The roots are thick and fleshy, and soon cling to these supports.

Other Cultural Points.—Abundant supplies of water are needed, and during hot weather the rafts or blocks should be dipped in water twice daily. When the plants are at rest, only enough water is required to keep the pseudo-bulbs from shrivelling. They should be suspended close to the glass in the *Odontoglossum* house when in growth.

Principal Species :—

elegans, 1' to 1½', win.,	— superbum, 1', win.,
dark ro. (<i>see figure</i>).	deep ro. Much larger
lindleyana, 1' to 1½', Sep.,	than the type.
ro., pur., wh.	spectabilis, 1', sum., ro.
Skinneri, 1', win., ro.	lil. (<i>Epidendrum spec-</i>
	tabile.)

Other Species :—

lindleyana Centeræ, win.,	melanocaulon, 1', Aug.,
ro., lil.	ro., pur., lil.

BARKLYA.

Stove trees (*ord.* Leguminosæ). *Syringifolia*, 30', yellow, is increased by seeds and cuttings in heat. It requires a compost of equal portions of loam, leaf soil, and sand.

BARLERIA.

Stove evergreen shrubs (*ord.* Acanthaceæ), some of which have flowers of considerable beauty. Propagated by cuttings of the young shoots, in spring, in a warm propagating frame. Loam, peat, and dried cow-manure, in equal parts, with sand, suit. *Barlerias* may be had in flower early in the year by striking cuttings the previous spring in the manner suggested, and such cuttings make neat little specimens in 5' or 6" pots. The plants may be cut back after flowering, and syringed copiously to encourage free growth.

Principal Species :—

flava, 1½', Jan., Meh., yel. (*syn.* gentianoides).

Other Species :—

buxifolia, 2', Jy., wh.	lichtensteiniana, 1' to 3'.
cristata, Jy., pur. bl. or	longiflora, 2', sum., wh.
wh.	lupulina, 2', Aug., yel.
Gibsonii, win., pur.	mitis (<i>see flava</i>).
involucrata, bl.	Prionitis, 3', sum., or.
— elata, bl.	repens, Jy., ro.

BARNADESIA (*syn.* XENOPHONTA).

Deciduous shrubs (*ord.* Compositæ), requiring a greenhouse temperature. They may be increased by seeds sown in heat in spring, and by cuttings of half matured shoots in April, placed under a bell-glass. A mixture of peat, loam, and sand, in equal parts, is a suitable compost. *Rosea*, 1½', May, rose, is a pretty plant, but it is seldom seen in this country.

BAROMETER.

Though the excellent weather forecasts published in the daily papers have induced some gardeners to dispense with a barometer, yet it is an extremely interesting instrument for him to possess; and if its records are taken down daily they afford very useful means of comparison in the course of years. The aneroid, a more sensitive

Barley (*see Hordeum*).

Barnardia (*see Scilla*).

instrument, is displacing the old mercurial tube barometer, but the latter is good enough for garden purposes, and may be made with care by an intelligent man, the chief requirements being the glass tube and the mercury; a piece of board to fix it to, and a scale copied on to the board from another barometer would also be necessary. Home-made instruments have been used for several years, and found very reliable.

BAROSMA.

Evergreen shrubs (*ord.* Rutaceæ) with showy Heath-like flowers. The plants are all natives of the Cape, and thus may be grown in a greenhouse temperature. They are possessed of a powerful and agreeable smell, which is chiefly centred in the glands in the leaves. Cuttings of tips of the ripened shoots soon root if placed under a bell-glass in a cool house, in spring or autumn. One-third loam, two-thirds peat, and sand, suit.

Principal Species :—

betulina, 2', Feb., Sep., wh.	scoparia, 1½', Ap., pur. (<i>syn.</i> dioica).
crenulata, 1', Jy., wh.	serratifolia, 2', Mch., Je., wh.
ovata, 2', My., wh.	
pulchella, 2', Feb., red, pur.	

BARREN FLOWERS AND PLANTS.

Though most really double flowers are necessarily barren, through the conversion of their reproductive organs into petals, yet the term is often erroneously applied by gardeners to the male or staminate flowers of the Melon, Cucumber, and Vegetable Marrow. These are readily distinguished from the female or fruit-bearing flowers by the absence from their base of the embryo Melon or Cucumber, which always accompanies their sister blossoms. The gaudy yellow corollas of the latter flowers are eminently adapted for the attraction of insects, by whose agency they are frequently fertilised; still, the gardener who wishes to ensure a satisfactory crop of fruit will do wisely not to trust entirely to the good offices of the insects in the case of Melons, but on a dry, hot day carefully bring the anthers of the male blossoms into contact with the viscid stigma found in the centre of the fruit-bearing flowers.

Barren fruit trees may be generally rendered fruitful by making a trench some 3' from the main stem, and carefully cutting back all the roots met with; or if barrenness is caused by unskilful pruning, it may easily be rectified by following the advice given under "Pruning." Strawberry plants are frequently barren to the extent of whole beds, and here good cultivation has been known to entirely fail in bringing about fertility; while runners taken from these barren plants have proved as sterile as their parents, neither flowers nor fruit being produced. Many Orchids and other exotics are barren in this country, though flowering freely, owing to the absence of the insects upon whose assistance they depend for fertilisation.

BARREN SOIL.

This term is generally applied to soils wherein one form of earth, such as chalk or clay, unduly predominates; but such predominance may be neutralised by incorporation with other soils. Excessively wet and boggy soils may be reclaimed by draining, and dry, arid soils rendered fertile by

deep cultivation, green manuring, or, in extreme cases, by irrigation. Waste land, to which the name is also often applied, may be by no means barren, as the many thriving garden plots on the sites of old brickfields eloquently testify.

BARRINGTONIA.

Stove evergreen trees and shrubs (*ord.* Myrtaceæ), not easy to grow, and of no particular decorative value. They may be increased by cuttings of the ripened side shoots, inserted in sand under a hand-glass, in bottom heat. A compost of two parts loam, and one of peat, with coarse sand, is required; and plenty of water must be given at all times. Temperature, from 60° minimum to 90° maximum.

Principal Species :—

echinata, 20', wh.	samoensis, My., sc.
racemosa, 30', sum., red.	speciosa, 6' to 8', pur., wh.

BARROW.

An indispensable garden vehicle, varying in character according to uses. Ordinary wheelbarrows are mostly of one pattern, made of wood, and put to many purposes. Grass and leaf barrows are useful in pleasure grounds. They have tall sides, and are suitable for holding large quantities of light material. Galvanised iron barrows are serviceable in removing hot cinders and clinkers from stoveholes. Water-barrows are arrangements in which wooden and galvanised tubs are swung on pivots, and, where water has to be removed for garden use, they are extremely handy. The framework and pair of wheels are usually made of light wrought iron. Plant-barrows are furnished with flat tops and wheels, and are used for the removal of pot plants. Hand-barrows are without wheels, and have a pair of handles at each end. They are generally furnished with four legs, and are manipulated by two men. Their chief use is for transferring plants from place to place, standing the pots on the flat, table-like top. Another useful hand-barrow is made on the same principle, but without legs. It is fitted with sides, and is excellent for moving plants, soil, and other loose material up and down steps.

BARTHOLINA.

This genus (*ord.* Orchidaceæ) consists of one small terrestrial Orchid from the Cape of Good Hope. *Pectinata*, 1', November, lilac, is grown in the cool house, but so far it has not been cultivated successfully in this country. A sandy compost of loam, peat, and chopped sphagnum appears to suit it best.

BARTONIA.

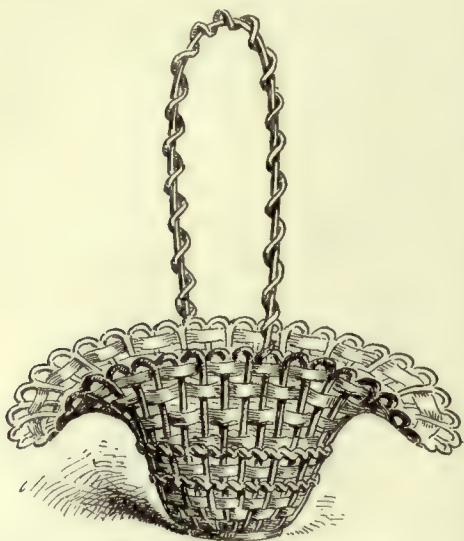
Pretty hardy annuals or biennials, propagated from seeds sown under glass in March, or in the open border in April. They can be grown in any good soil, but the biennial species are wintered under glass. The *Bartonia*s are classed by botanists under *Mentzelia*, the plants they recognise by the name *Bartonia* belonging to the Order *Gentianæ*; while those now under notice belong to the *Loasacæ*. The best species is the annual *Bartonia aurea*, which makes a good spring plant if sown in September. If sown in spring, it blooms in autumn. It has yellow flowers with finely cut downy foliage. Others are albescent,

Barrenwort (see *Epimedium*).
Barrota (see *Pandanus*).

yellow; nuda, and ornata, white. The two last may be grown as annuals if sown early in heat.

BARTSIA.

Small perennial or annual plants (*ord.* Scrophularinæ), of little value for the garden. The native perennial alpina, 5", June, purple blue, is among the best, although not recommended for the



A PRETTY CANE BASKET FOR ROSES.

garden. *Castilleja coccinea* and *C. pallida* are sometimes called Bartsia. The perennial Bartsias are propagated by division or seeds, and grow in common soil. The annuals may be treated as half-hardy, or, in the case of the native species, as hardy annuals.

BASELLA.

Malabar Nightshade. An interesting, but not showy, climbing stove plant (*ord.* Chenopodiaceæ) of biennial habit; though by sowing early in February in heat the plants will bloom the same year. They require ordinary stove treatment, and can be grown in any rich soil. The only species is *rubra*, of which there are several varieties, formerly known by specific names. The type grows about 8' high, blooms in August, and has pink flowers. The varieties have white or pale purple flowers. Some of the plants formerly known as *Basella* are now included with the *Tandonias*.

BASIL.

A sweet scented annual herb (*Ocimum*, *ord.* Labiatae), grown in many kitchen gardens. The leaf tops are used for flavouring and other purposes. It is raised from seeds sown in boxes under glass in April, hardening off the seedlings, and planting out at the end of May. Sow in May outdoors for succession. Ordinary garden soil, made fine on the surface, will do. Slugs are partial to young plants. To check them place a little sifted coal ashes round each specimen after planting. Allow 1' between the rows, and the same distance from plant to plant. When sown outdoors no transplanting is necessary, simply

thinning out the seedlings when large enough. Pull up the plants early in September, tie in bunches, and hang them in a dry shed for winter use.

Principal Species :—

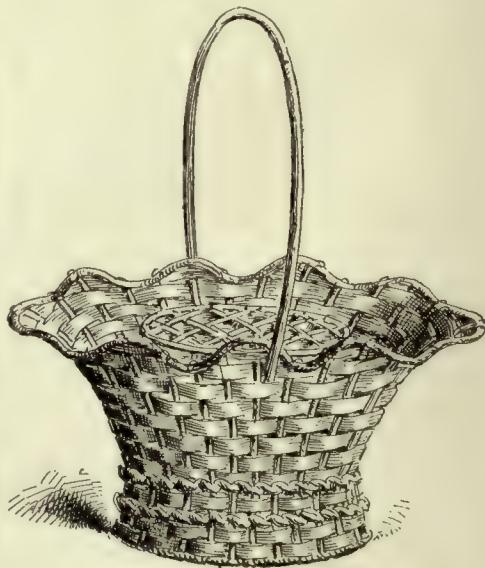
Ocimum basilicum, 1". The common Sweet Basil. — minimum, 3". Bush Basil, a dwarf, bushy plant. Treat in the same way as the above.

BASKETS, ORNAMENTAL.

These are largely employed in gardens, and vary in character according to the purpose for which they are required.

Hanging Baskets.—Receptacles formed of galvanised wire, wood, and terra-cotta, and when furnished with flowering, foliage, and trailing plants, and Ferns, used for suspending in conservatories, corridors, rooms, and windows. If tastefully arranged they have a pleasing effect. Hanging baskets of many sizes and shapes are manufactured. They are lined with fresh, green moss, and filled with a suitable compost before being furnished with plants. A simple, home-made basket is formed by obtaining a hoop of strong wire for the rim, and making the bowl with close meshed wire netting attached to the rim. Fasten three strands of wire to the top at equal distances, and a hook for suspending the basket. Rustic looking wooden baskets are suitable for Ferns and Lycopodiums. Baskets made of Fir cones are also useful for the same purpose. Teak wood and Oak baskets are largely employed for Orchids.

Plant Baskets.—These are round, with flat bottoms, and made of strong wire. They are



A NEAT CANE BASKET FOR THE TABLE.

furnished with flower and foliage plants in pots, and placed on tables for the adornment of rooms. When tastefully furnished they are effective. Cane baskets (see figures) are pretty for the table.

Rustic Baskets.—For ornaments on lawns, and elsewhere, for the reception of flowering and foliage

plants, rustic baskets are useful. They may be made of wood, 2' to 3' in diameter, and from 8" to 10" deep. The outer sides and rim should be covered with cork, or Oak bark, and be furnished with hoops of wire for training the growths of climbing plants over the top. They may be placed on low stumps and other conspicuous places in the garden, filled with soil, and furnished with suitable plants. Strong wire arrangements in the form of baskets are employed in some gardens, and furnished with Ivy, Roses, and other plants. For market baskets see MARKET.

BASSIA.

These East Indian trees (*ord.* Sapotaceæ) may be grown in peat and loam, in a stove house, but they are of no horticultural value. In India, however, and in tropical countries where they have been introduced, they have an economic value.

Principal Species :—

butyracea, 40', Je., wh.	longifolia, 40', My., Jy., wh.
latifolia, 40', My., Jy., wh., yel.	

BASS MATS.

The name given to tough, durable mats, chiefly imported from Russia, and made from the inner bark—bast—of the Lime tree. Two of these mats fastened together by their edges to form a bag, and stuffed with straw, make a very efficient winter protector for plants grown in cold frames, while a single mat may be usefully employed in summer to shield plants from too powerful sunshine. Before using the mats, the loose strands at both ends should be carefully knotted together in fours, which, by preventing fraying, will conduce to the longevity of the mat. When mats have become too thin or broken to be efficient for protection, they may be made to serve a useful turn for covering standpipes in frosty weather, and protecting stems of Roses or other tender subjects; or their strands will furnish useful tying material for Celery, Lettuces, etc.

BAST.

The inner bark of trees, of which that from the Lime tree was formerly extensively used for tying purposes, but is now superseded by *Raphia* (raffia), which see.

BASTARD TRENCHING.

A valuable means of improving soil. It is performed by opening a trench about a yard wide and a good spit deep, the soil thus removed being wheeled to the other end of the plot for filling in when the work is finished. Into the trench thus made a good layer of manure should be placed and dug in with the bottom spit of the trench, filling up to the ground level with the top spit from the adjoining undug portion, and so on until the end of the ground is reached, when the deported soil should be used to form the top layer.

BATATAS.

This genus, which includes the Sweet Potato (*edulis*), is now referred to *Ipomoea*, to which reference may be made.

BATEMANNIA.

The only species (*Colleyi*, 8', August, purple, green, *ord.* Orchidaceæ) has always been comparatively rare in cultivation. A temperature of from 60° to 65° during winter, and from 70° to 85° during

summer, suits it; and in the matter of compost its requirements are met by a mixture of broken crocks and sphagnum, with a little peat fibre. A shallow Teak basket is the best receptacle for this Orchid, but even when such is used it is advisable to mound up the rooting medium, so as to raise the plant and allow water to pass from it rapidly. Suspend basket and plant as near the roof-glass as the outside conditions will permit with safety, always remembering that cold draughts and drip are extremely injurious.

BAUERA.

Evergreen greenhouse shrubs (*ord.* Saxifragæ). They flower freely, and are not difficult to grow if potted firmly in sandy peat and loam over ample drainage. When hard-wooded subjects were fashionable the Baueras were largely grown, and it must not be thought that they are not worth cultivating because the interest in them has declined. Firm cuttings will root readily if inserted in very sandy soil and placed under a bell-glass.

Principal Species :—

rubioides, 2', Sep., pk. (*syn.* rubizefolia).

BAUHINIA.

Very widely distributed through various tropical countries are the numerous species of this remarkable genus (*ord.* Leguminosæ). Almost all are stove plants, though a few, notably *Galpini*, will succeed in a cooler structure. All are shrubby, and not a few are of climbing habit and suitable for clothing the rafters of a fairly large house. Propagation is effected by placing cuttings of half-ripe growth in sandy soil, and keeping them in a close place where bottom heat is at command. Good loam and sand will suffice as compost, but it is advisable to add a little leaf soil or peat. When growing freely an abundance of water is necessary at the roots and overhead, but during winter the supply should be considerably reduced. With the exception of *Galpini* the species do not flower freely under cultivation.

Principal Species :—

<i>Galpini</i> , 6', Jy., wh.	<i>purpurea</i> , 6', Aug., pur.
<i>grandiflora</i> , 6', Jy., wh.	<i>Vahlhi</i> , 20', My., Jy., wh., pk.
<i>natalensis</i> , Sep., wh.	

Other Species :—

<i>aculeata</i> , 6', Jy., wh. (<i>s.l.n.</i>)	<i>malabarica</i> , 15', My. to Aug., wh.
<i>pubescens</i> .	
<i>acuminata</i> , 8', Jy., wh.	<i>tomentosa</i> , 6', Je., Jy., yel., wh.
<i>anatomica</i> , 6', Aug., wh.	
<i>coccinea</i> , 8', Ap., Aug., sc.	<i>variegata</i> , 6', Je., striped.
	— <i>candida</i> , 8', Je., wh.

BAY TREE.

The Sweet Bay has from ancient times been a popular plant. Formerly it was used chiefly for crowns wherewith to deck the brow of a winner in the Roman and Grecian games, or the successful students of art or medicine. The degree of Bachelor reminds us of this old custom, for the word itself signifies a successful student crowned with Laurels (*Bay*). "Poet Laureate" is a similar reminder, the term literally meaning "the poet crowned with Laurels." Nowadays Bay leaves are freely used in flavouring, while the trees themselves, when trained as standards or pyramids, are utilised for hall, terrace, or verandah decoration. (*See also* *Laurus nobilis*.)

Batschia (*see* *Lithospermum*).

BEANS, BROAD.

Description.—A highly nutritious annual vegetable (*Vicia* or *Faba vulgaris*, *ord.* Leguminosæ) when the seeds are eaten young and fresh. Garden varieties are divided into two sections, viz. true Broad or Windsor Beans, producing short, broad pods; and Longpods. The latter are best for early sowing, and the former for later supplies.

Propagation.—From seeds sown in November in a warm situation for an early crop, selecting a Longpod variety. Sow again successively in February and March to maintain the supply.

Soil.—For autumn sowing, select a sheltered site where the soil is rich and somewhat dry, but a cool, rather tenacious medium is best for crops sown in the spring. The ground should be trenched, and decayed manure incorporated with the subsoil.

Enemies.—The black dolphin is the worst enemy of the Broad Bean, and, if not checked, will soon ruin a crop. The females locate themselves amongst the leaves at the top of the stem, and produce progeny at a very rapid rate. If not disturbed, the stems soon become a living mass of

BEANS, FRENCH OR DWARF KIDNEY.

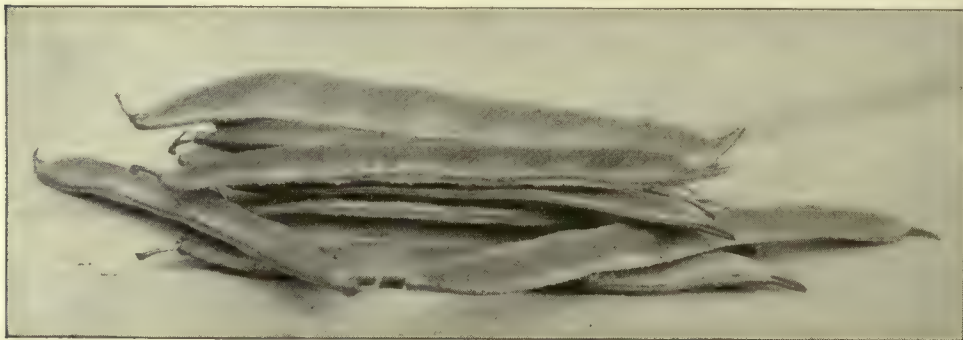
Description.—French Beans (*Phaseolus vulgaris*, *ord.* Leguminosæ) are the earliest of the Kidney Beans. Though most of the varieties are dwarf, there are French Beans of climbing habit, which produce pods similar to those of the dwarf section.

Propagation.—From seeds sown in beds, pots, and boxes for forcing, and in the open for outdoor crops, at the end of April, and later for succession.

Soil.—French Beans will succeed in most gardens, but the ground should be deeply dug in the winter, and well rotted manure incorporated with the subsoil.

Other Cultural Points.—To obtain early crops outdoors seeds may be sown in boxes under glass, hardening, and transplanting 1' apart in rows 2' asunder, when danger of frost is past. Pick by rule as soon as the pods are ready, and whether required for use or not. To provide a succession make sowings at intervals to the middle of July.

Forcing.—Where low heated pits are provided French Beans may be forced from November and



RUNNER BEANS NE PLUS ULTRA.

Aphides. On the first appearance of the pests, pinch out the tops of the plants and burn them, afterwards syringing with an insecticide formed by boiling half a pound of soft soap in one pint of water for an hour. While hot add quarter of a pint of paraffin, and dilute with four gallons of water. Mix thoroughly by churning with a syringe.

Varieties:—

The following is a good selection.

Beck's Gem, dwarf.	Green Giant.
Early Mazagan (good for aut. sowing).	Green Windsor.
Giant Windsor.	Seville Longpod.

BEANS, BUTTER OR WAXPOD.

These Beans are more esteemed in America and on the Continent than in England. The pods, which are of a creamy colour, stringless, tender, and of good flavour, are boiled whole. Butter Beans may be sown in boxes or pots in March and April under glass, and be planted out when danger of frost is past. They may also be sown outdoors in succession from May to July. The leaves are small, and pale in colour.

Varieties:—

Mont d'Or (climbing), long yel. pods.
— (dwarf), pods similar, habit dwarf.

December onwards, by sowing seeds in beds of soil over bottom heat. Boxes and 8" and 10" pots may also be employed, using a good compost of light loam and decomposed manure. A suitable temperature is from 60° to 70°. Support the growth with short twigs, and stand the pots on a shelf close to the glass, syringing frequently to keep down red spider, which is the bane of forced Beans.

Varieties:—

Canadian Wonder, outdoors.	Osborn's Forcing.
Ne Plus Ultra, early, outdoors, or forcing.	Sion House, good forcer.

Climbing Habit.—Tender and True and Veitch's Climbing require sticking, and produce long straight pods up the stems in great profusion.

BEANS, HARICOT.

These are chiefly grown for the sake of the seeds, which, on the Continent, are ripened, dried, and cooked as a vegetable. The Beans do not ripen well in this country.

BEANS, RUNNER.

Description.—An indispensable annual vegetable (*Phaseolus multiflorus*), which, under proper treatment, is productive from the end of July till the

first sharp frost in the autumn. Some varieties produce scarlet, and others white, flowers, and the pods are larger and rougher than those of French Beans.

Propagation.—Seeds may be sown under glass in April, for transplanting late in May, to get an early crop. Sow outdoors in May, and again in June if a succession is needed.

Soil.—The ground should be deeply trenched in the winter or early spring, and a liberal dressing of farmyard manure worked into the subsoil. A deep rooting medium is of prime importance.

Other Cultural Points.—Runner Beans may be sown in single or double rows, but overcrowding must always be avoided. Distribute the seeds so that the young plants will be at least 9" apart, and cover with 3" of soil. Dust young plants with lime and soot to keep slugs at bay, and provide stout sticks before they commence to run. Supply water and liquid manure in dry weather, and mulch heavily with half decayed manure. Pick as soon as the pods are large enough, not allowing seeds to ripen while the plants are producing a crop for ordinary use. Though usually grown as climbers, these Beans may be kept dwarf, and still be productive, by pinching out the points of the shoots on several occasions. Runner Beans are useful for training over arches and fences; and, apart from their culinary value, they are effective summer climbing plants for making screens and providing shelter.

Varieties :—

Best of All.	Mammoth White.
Mammoth Scarlet.	Ne plus Ultra.

BEARBIND, OR BINDWEED.

The Bearbind, Barebind, or Bindweed is *Convolvulus arvensis*, or *Calystegia sepium*. The former makes a pretty basket plant, but both are very dangerous to introduce into a garden because of their underground running habit, which makes them difficult to eradicate. The only way to effect this is by regularly destroying every shoot as it appears above the soil, and by forking out the roots whenever an opportunity occurs. C. arvensis looks charming on a trellis with its pretty leaves and its pink or white flowers about 1" across, but its spreading habit calls for its exclusion, unless confined by stone or concrete.

BEATONIA.

A small family (*ord.* Iridæ) of bulbous Irids, needing the shelter of a greenhouse, except in the most favoured parts of the country. Where grown out of doors they are liable to severe injury by damp and cold during winter. Propagation by seeds or offsets. Botanists now unite them with Tigridias.

Principal Species :—

atrata, 1', Aug., dark pur.	purpurea, 8", Ap., My., pur.
curvata, 8", Ap., pur.	

BEAUCARNEA.

Graceful and singular greenhouse plants (*ord.* Liliacæ), which thrive in loam and sand, and are propagated by imported seeds.

Principal Species :—

glaucia, grey.	recurvata.
— latifolia, broad leaved.	stricta.

BEAUFORTIA.

Australian shrubs (*ord.* Myrtacæ) that are ever-green, and need the protection of a greenhouse.

Half-ripened shoots root easily if placed in sandy soil under a bell-glass, but without the aid of artificial heat. Good drainage, and a compost of loam, peat, and sand, are essential.

Principal Species :—

decussata, 3', My.,	sparsa, 3', Je., red (<i>syn.</i> splendens)
purpurea, 3', Jy., pur.	

Other Species :—

carinata, 3', Je., sc.	macrostemon, 3', Jy., pur.
Dampieri, 3', My., pk.	

BEAUMONTIA.

Handsome plants (*ord.* Apocynacæ) suitable for training to the roof of a stove or intermediate house. An ample root run is necessary, and it should be well drained and filled up with rich loam and peat, roughly pulled to pieces, with some sand or mortar rubble added. Propagation is effected by cuttings of half ripened shoots.

Principal Species :—

grandiflora, 20', Jy., wh.	longifolia (<i>sec</i> grandiflora).
jerdoniana, 20', Jy., wh.	

BECKMANNIA.

This is a small genus of Grasses (*ord.* Gramineæ) seldom cultivated. Easily raised from seed.

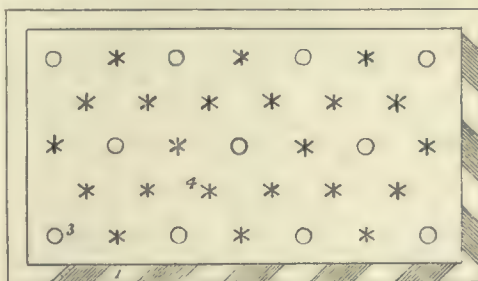
Principal Species :—

erucæformis, 2', Jy., grn.

BED.

A bed may be described as a portion of the garden, of any size or shape, devoted to the display of flowers, or raising seeds and cuttings. Beds employed exclusively for the latter purposes are termed nursery beds, and are generally some 4' in width, with a narrow path running along either side. When made of this width they are easily tended for the weeding, sowing, and thinning of the occupants.

Flower Beds.—Of beds employed for the display of flowers the circular form is perhaps the most generally useful, though the oval is highly popular. Among ornamental forms the half-moon or crescent shape, the star, the shamrock, and the fleur-de-lys, are easily made, and look very effective when planted with dwarf growing subjects. Flower beds



A FLOWER BED THAT WAS ADMIRER IN HYDE PARK.

Light portion of border (1) *Cineraria tomentosa*; shaded portion of border (2) *Iresine Wallisii*; circles (3) *Rudbeckia laciniata flore pleno*; crosses (4) *Fuchsia Madame Cornillon*, white and scarlet.

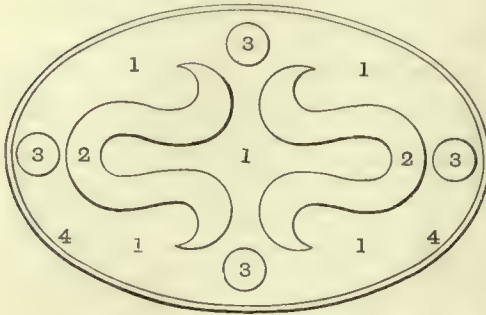
should always be well raised above the surrounding level, and kept highest in the centre, both of

which help to show off their occupants to advantage. They should be well and deeply dug, and in most instances liberally manured; with their edges, if the beds are on grass, kept true and trim by the use of edging iron and shears. Beds are often formed in conservatories, and are greatly to be

called a bed—e.g. Onion bed, Carrot bed, Asparagus bed, etc.

BEDDING OUT.

The term is applied by gardeners to the removal of tender plants from the houses, pits, and frames wherein they have been raised and protected from the cold, to the open ground or beds wherein their

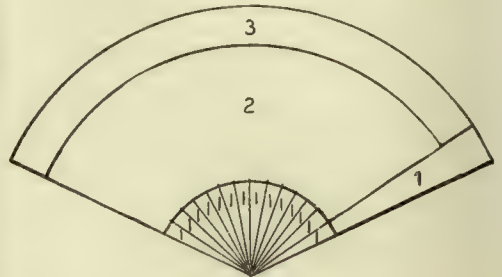


AN OVAL BED.

Outline of central figures (2) and circles (3) laid out with *Dactylis elegantissima*. The planting is as follows: 1, blue *Myosotis*; 2, crimson Tulips; 3, yellow Daffodils; 4, Golden Feather alternated with white Crocuses.

recommended, as exotic plants grown in them are presented under an approach to natural conditions. Alpine beds are those containing specimens of mountain flora, and are very interesting adjuncts to the garden.

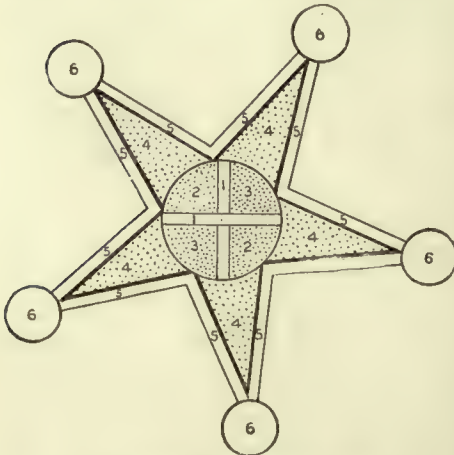
Reserve beds are used for the preservation of evergreen and carpeting or edging plants which are



A "FAN" BED FOR SPRING.

1 (framework), radiating rows of yellow Tulips; 2, mixed Parrot Tulips on groundwork of blue *Myosotis*; 3, scarlet or white Tulips.

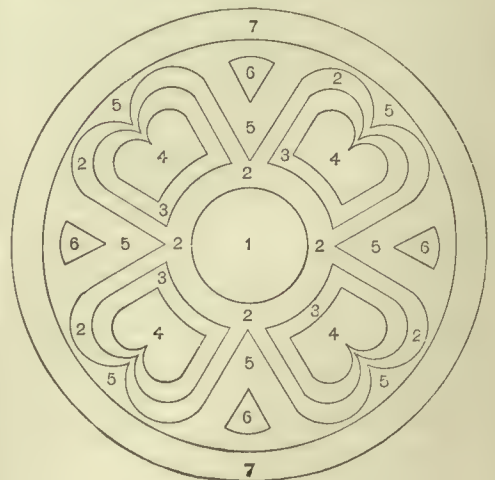
flowering period will be passed. This system is immensely popular, and in fact enjoys almost a monopoly of summer flower gardening, in spite of the vigorous onslaughts made upon it by various writers. The transference from frames to beds is generally performed about the end of May or the beginning of June for the more tender plants, as



A "STAR" BED FOR BULBS.

1, yellow Hyacinths; 2, rose ditto; 3, white ditto; 4, dark blue ditto; 5, yellow Crocuses; 6, *Scilla sibirica*.

temporarily removed from the flower beds proper; or they may contain plants of Asters, Stocks, and other annuals for filling gaps or repairing damages in the bedding designs. The plot of ground in the kitchen garden devoted to a certain crop is also



A CARPET BED.

1, *Coleus Verschaffeltii*; 2, *Pyrethrum aureum cristatum*; 3, *Alternanthera amena spectabilis*; 4, *Cerastium tomentosum*; 5, *Lobelia Crystal Palace Gem*; 6, *Alternanthera paronychioides*; 7, *Sedum glaucum*.

danger from frost is then considered to be past. Whatever date is selected for bedding out, the plants should previously have been well hardened by exposure in cold frames: first with the lights

on, then with the lights off during the day and returned at night, and finally kept off altogether. The beds should be well dug as long previously as possible, but should not be levelled until the day selected for planting them, using a wooden rake in the operation, and keeping the centres well up. Well rotted manure should be liberally added to beds devoted to subtropical plants, or those grown for foliage alone, and a small portion will benefit such plants as Asters, Stocks, Petunias, and Nicotianas, but for Geraniums, Nasturtiums, and Tropæolums no manure whatever should be given, or the result will be a mass of leafage at the expense of flowers. As a rule the centre of the bed is the best place to commence the planting, but a wise plan, and one generally followed, is to lay out the plants in their allotted positions, rearrange at discretion, and insert them in the order most compatible with the general circumstances. In selecting the occupants for the various beds care should be taken that not only do those of a single bed harmonise or contrast, but that the whole series of contiguous beds blend into one harmonious whole. Flatness should be avoided by breaking up the surface with what are called "dot" plants—i.e. taller plants dotted over the beds between the dwarf occupants. Graceful Palms, Dracænas, variegated Maize, Grevillea robusta, Cyperus alternifolius, and C. natalensis, with narrow-leaved Aralias, are a few of the many popular "dot" plants employed.

Staking any plants requiring assistance, constantly stirring the surface soil with the Dutch hoe, removing dead leaves and flowers, and keeping the edges of the beds neat and trim, are the chief points of routine after bedding out is finished, until with autumn comes the removal of the summer bedders and the insertion of those of winter and spring.

BEDEGUAR.

A moss-like gall formed on Rose shoots as a result of the attack of an insect (*Cynips Rosæ*). See ROSES.

BEDFORDIA.

A greenhouse shrub (*ord.* Compositæ) of no special merit. It needs a very porous compost, and during the winter requires very little water.

Principal Species:—

salicina, 4', Ap., Je., yel. (*syn.* *Cacalia salicina*).

BEECH.

The common Beech, *Fagus sylvatica*, is a noble, handsome, and useful tree, and one that reaches a considerable size and age. In either of its many varieties the Beech is a graceful park tree. In autumn the colouring of Beech foliage is extremely bright, and if it is near a purple leaved form the contrast late in the year is remarkable. Unfortunately, in the neighbourhood of large towns the system of surface drainage renders it annually more difficult for such a foliaceous tree to contend against periods of drought, consequently some care is necessary in selecting sites for specimens. The Nuts (Mast) of the Beech are nutritious, and a useful oil is expressed from them; pigs fatten quickly if turned into a Beech wood when the Nuts are falling. Beech timber is extensively used in turnery and joinery.

BEEES, FLOWERS FOR.

The value of flowers for bees depends very much upon the natural pasture available at the time the

plants are in bloom, so that those of service in some districts are of little value in others. A large number of flowers are frequented by the bees, but the following are considered as among the most useful in their seasons: *Eranthis hyemalis* (Winter Aconite), *Galanthus*, *Crocus*, Willow, Violet, Arabis, Lime, Cherry, Plum, Pear, Apple, Currant, Raspberry, Blackberry (and other Rubuses), *Cytisus*, Genista, Maple, Sycamore, Plane, Hazel, Heath, Ivy, Cheiranthus, Bean, White Clover, *Alyssum maritimum*, *Anchusa italica*, *Ambrosia mexicana*, *Borago officinalis*, Clarkia, Salvia, *Melilotus leucantha*, *Collinsia*, *Godetia*, *Limnanthes*, *Gilia*, *Cerinth*, *Polemonium*, *Leptosiphon*, Lupins, *Mignonette*, Malope, *Tropæolum majus* and minor, *Scabiosa*, Stocks, Thymus, Sweet Peas, *Whitlavia*, *Centaurea Cyanus* (Cornflower), *Calliopsis*, *Phlox Drummondii*, and *Iberis*. There are many others.

BEET.

Description.—(*Beta vulgaris*, *ord.* *Chenopodiaceæ*.) Though grown chiefly in gardens on account of its usefulness as a salad vegetable, some forms of Beet are employed in flower gardens for the sake of the colouring of the foliage, which is very effective. As a culinary vegetable Beet may be divided into three sections: viz. tap-rooted, with long tapering roots; Turnip-rooted, with globe roots like Turnips; and Spinach Beet (*Beta Cicla*), so called because the leaves and midribs are boiled and eaten in the same way as Spinach. This plant is also called Perpetual Spinach.

Propagation.—From seeds sown late in April or early in May outdoors, in drills 15" apart and 2" deep. When large enough to handle, thin the seedlings to 1' apart.

Soil.—Beet likes a deep open soil, but not too rich, or the roots will be large and gross. Ground that has been well manured for a crop in the previous year is best. If the soil is wet and retentive, a dressing of old mortar rubble, road scrapings, and wood ashes, may be dug in with advantage.

Other Cultural Points.—The aim of the cultivator is not to get extra large specimens. Shape of root, quality, and colour are the chief points; and these are obtained by sowing seeds of a selected strain, and having the land in a good but not over rich condition. During the season of growth run the Dutch hoe frequently between the rows. The Turnip-rooted Beet is best for early use, and the tap-rooted for main crop.

Lifting and Storing.—When frosts make their appearance in the autumn the crop should be lifted, and stored for winter use. Use a fork for lifting, and take care that the tap root is not broken or the skin bruised. Remove the leaves without damaging the crowns. The roots may either be pitted in the open the same as Potatoes, or stored in a cool, dry shed. In the latter case they are more accessible in the winter, and may be kept in good condition by adopting the following method. Spread 1" of moist sand on the floor in the form of a circle or square. Place on this a layer of roots with the crowns pointing outwards, and then use sufficient sand to cover them. Continue with another layer of roots, and so on till they are all stored. The roots may be removed from the top as required without disturbing those underneath.

Enemies.—In the early stages of growth Beet

often falls a prey to the ravages of slugs, which will soon destroy a bed if not checked. Dust the plants with soot, lime, and sifted wood ashes, when damp with dew or rain. Sparrows and other small birds are very partial to the leaves of young plants, and check the growth by eating them. Protect the plants with close-meshed fish netting, or strands of black thread stretched over them. Dust with soot and lime.

Varieties :—

Blood Red.	Perpetual or Spinach Beet.
Cheltenham Green Top.	Pragnell's Exhibition.
Dell's Crimson.	Silver or Seakale, the stalks and midribs are served like Seakale.
Egyptian Turnip-rooted.	
Improved Globe.	

Dell's Crimson, *Dracæna* leaved or Chilian, and Belvoir Castle are good for bedding.

For the names of species see BETA.

racés that are comparatively easy to grow, and which produce masses of bright flowers at various seasons. It is impossible to give general instructions to apply to so large a family, consequently five divisions have been made in the present work, i.e. (1) Species, (2) Fibrous rooted, (3) Foliage, (4) Tuberous rooted, (5) Winter flowering.

(1) BEGONIA SPECIES.

Propagation.—The plants may be increased by cuttings inserted in sandy soil and placed in a gentle bottom heat in spring or summer, those that flower naturally in winter and spring being propagated as early as possible. Very many may be divided after flowering, and if the tops are cut back, and each division is put into as small a pot as possible, it will soon start away, and may be potted on as necessity demands. Leaf cuttings can be secured in nearly every case by cutting



BEET DOORNIES' SELECTED.

BEETLES.

Many beetles have an interest for horticulturists, if only because of the damage they do to crops. The principal ones are dealt with under the crops they associate themselves with.

BEFARIA.

A small family of American plants (*ord.* Eriacacæ) that need to be grown in a warm greenhouse and potted in a mixture of loam, peat, and sand. Cuttings made of young growth, with a heel attached, strike readily in sandy soil.

Principal Species :—

glauca, 3', Je., pur. (*syn.* *Bejaria glauca*).
racemosa, 4', Je., pur. (*syn.* *Bejaria racemosa*).

BEGONIA.

The usefulness of the *Begonia* family (*ord.* Begoniacæ) is fairly well understood by the majority of horticulturists, but it is only when a rich collection of species and well marked varieties like that in cultivation at Kew is inspected that the size of, and variation in, the genus can be understood. Only a very few species have received attention at the hands of gardeners, chiefly because the florist and hybridist have produced

through the ribs and veins of a leaf, and then pegging it flat on to a moist, sandy surface in a propagating frame. Seed sowing needs to be carefully done, for the seeds are very small, and easily blown or washed away. The resulting seedlings, if they come up in thick patches, will damp off at a marvellous rate. Sow on the even surface of some previously moistened sandy soil, cover with a glass, and give shade. Some species of special value for winter flowering are placed in another section.

Soil.—Good loam and leaf soil, in equal parts, with a liberal addition of dried cow manure and sand, make an admirable rooting medium.

Other Cultural Points.—To the intelligent cultivator it will soon be apparent that many species are shallow rooters, and these, like *gracilis*, will be placed in broad, shallow pans; some make large bushes, like *haageana* and others, and these will be afforded an ample root run by the provision of large pots or a small border; others again are naturally pendulous, suggesting basket culture; and still others, like *fuchsioides*, grow so tall that they may be trained to pillars or rafters. All the species are best managed in an intermediate house, where the atmosphere is kept fairly moist the whole year round.



TYPES OF TUBEROUS BEGONIAS.

1, PRINCE OF WALES ; 2, GOLDEN QUEEN ; 3, QUEEN ALEXANDRA ; 4, MRS. ANDREW TWEEDIE ; 5, MASTERPIECE

Principal Species and Hybrids :—

albo-coccinea, 1½', Oct.,	haageana, 4', Aug.,
Mch., sc., wh.	Dec., ro.
ascotiensis, 2', Aug., wh.	Ingramii, 4', Mch., sc.
Dregei, 2', Jy., Aug.,	Pres. Carnot, 3', Jy.,
wh.	Oct., sc.
fuchsoides, 6', Dec.,	sanguinea, 3', Je., wh.
Feb., sc.	semperflorens, 1½', Jan.,
Froebelii incomparabilis,	wh. or ro.
2', Jy., sc.	socotrana, 1', Nov., ro.
gracilis, 2', My., Jy.,	weltoniensis, 1½', Dec., pk.
pk.	



Photo: Cassell & Company, Ltd.

NEW SCARLET TUBEROUS BEGONIA
MR. W. G. VALENTINE.**Other Species and Hybrids :—**

acerifolia, 3', Jy., wh.	incarnata, 2', Aug., pk.
aptera, 3', Jy., wh.	knowsleyana, 2', Sep.
cinnabarina, 2', Aug., or.	lindleyana, 3', Je., wh.
sc.	manicata, 3', Ap., pk.
coccinea, 3', Ap., sc.	natalensis, 2', Nov., wh.,
evansiana, 3', Sep., flesh.	ro.
geranioides, 1½', Sep., wh.	nitida, 1½', Aug., pk.
hookeriana, 2', Jy., pk.	picta, 3', Aug., pk.
incana, 1', Ap., wh.	

(2) FIBROUS ROOTED.

Description.—Although there are many species of Begonias with fibrous, as distinguished from tuberous, roots, yet from a purely horticultural point of view the term "Fibrous Rooted" applies more particularly to the now fairly large group of varieties and hybrids of *Begonia semperflorens*. The parent of this group is a native of Brazil, whence it was introduced as far back as 1829. It is perennial, but may be successfully treated as an annual, as may all its forms. Each member of the group grows about 1' in height, throwing up numerous growths from the base, and making, without any help in the way of pinching or training, pretty, shrubby plants that bloom profusely

and continuously over a very long period. As summer bedding plants the fibrous rooted Begonias are useful, and, as they have the merit of being also winter flowering, they may be potted up from the open before frosts occur, to bloom all through the dull months in an intermediate house. The variety of *B. semperflorens* sent out by Vilmorin, of Paris, under the name of *rubra*, and subsequently distributed in this country as *Crimson Gem* and *Vernon* variety, is remarkably useful and beautiful, because, in addition to its scarlet flowers, there is the attraction of its leafage, this turning to a brilliant crimson bronze soon after the plants are bedded out in early June. One other member of the group calls for special mention, as illustrating what has been written elsewhere concerning improvement; this is *semperflorens gigantea*, raised by M. Lemoine, of Nancy, a splendid subject for a warm conservatory, where it will produce its rose or red flowers continuously from early autumn to late spring. Two species are combined in this plant, namely, *semperflorens* and *lynchiana*, and with first-rate results, the plant having all the best



Photo: Cassell & Company, Ltd.

NEW SCARLET TUBEROUS BEGONIA
GENERAL BADEN-POWELL.

qualities of the former with the added vigour and larger proportions of the latter. In either its rich carmine or rose coloured forms *gigantea* should be cultivated as a pot plant.

Propagation.—It is an easy matter to raise a stock of this group from seed, but as those of hybrid origin do not come quite true such must be propagated by cuttings, inserted in sandy soil during spring or autumn, the former for preference; these root freely in a propagating house. Seed

should be sown in January or February, in heat, using well drained shallow pans of very finely sifted loam, peat, and sand, scattering the seed thinly and carefully on the evenly pressed surface. Moisten the soil previous to seed sowing, and subsequently cover with a sheet of glass.

Other Cultural Points.—A gradual hardening off will of course be necessary ere transference to the open ground occurs in summer. When grown expressly for winter flowering it is not necessary to sow so early. The aim should be to secure sturdy, bushy growth, and hold the forces of the plants in

the Ferns. Begonia Rex, known to every gardener, is one of the most accommodating of plants, and thrives either in a stove, the shadiest corner of a greenhouse, or a dwelling-room. An intermediate temperature is best for bringing out the exquisite purple, silver, grey, emerald, olive, and other shades of colour, and to secure free growth and large leafage. Frequent potting should be avoided, while as regards compost this group is suited by a lighter rooting medium than is generally afforded Begonias. Thrips being partial to them, it is advisable to syringe freely during summer, but during



Photo: Cassell & Company, Ltd.

NEW CREAM-COLOURED TUBEROUS BEGONIA MRS. A. TWEEDIE.

reserve until autumn. Moderately rich soil and medium sized pots should be used.

Selection of Hybrids and Varieties :—

Carrieri, 1', Oct., Mch., wh.	Reading Snowflake, 1', Jy. to Oct., wh.
Coral Gem, 1', Jy. to Mch., ro.	semperflorens gigantea, 2', Sep. to Mch., ro.
Duchess of Edinburgh, 1', Jy. to Mch., wh., pk.	— rosea, 2', Sep. to Mch., red.
Duchess of York, 1', Jy. to Mch., car.	— rubra, 1', Jy. to Oct., sc. (<i>syns.</i> Crimson Gem, atropurpurea, and Vernon).

(3) FOLIAGE.

Description.—Associated with Ferns in a rockery or fernery, under glass, all the foliage Begonias are valuable for their own sake, and also for the foil they provide to the delicate frondage and colour of

winter water must be given sparingly, or the thick, fleshy rhizomes so many possess will rot.

Propagation.—Every garden boy knows how readily foliage Begonias can be increased by laying a leaf upon a moist surface in a warm house, having previously cut through the principal ribs in several places. Buds form at the cuts, emit roots, and can then be detached and potted.

Some wondrously beautiful foliage Begonias have been raised by crossing Rex with Griffithii, discolor, and other species; and also by intercrossing varieties and selecting the best resulting seedlings. Some foliage Begonias, such as Gloire de Sceaux and Arthur Mallet, are useful as winter flowering plants also, the former particularly so, for one of its parents is socotrana. These and allied forms are propagated from cuttings; they are of taller growth than the rest of the group.

Selection of Species and Varieties :—

Arthur Mallet, 3', dark pur.	Rajah, 6", br., olive grn.
decora, 8", coppery bronze.	Rex, 1', grn., pur., silver.
	Sander's Masterpiece, 1', crim., pur., silver.



Photo: Cassell & Company, Ltd.

NEW WHITE TUBEROUS BEGONIA LORD ROBERTS.

Gloire de Sceaux, 3', silver pur.	Souv. de Jean Bart, 1', grn., pur.
Griffithii, 9", olive grn., wh.	Thwaitesii, 1', grn., pur., grey.
imperialis, 6", br., grn.	Winter Beauty, 9", grn., silver.
Lady Annesley, 1', silver grey, crim., grn.	Winter Jewel, 1', grn., dotted silver.
Mrs. F. Sander, 1', grn., silver, ro.	Winter Queen, 1', olive grn., grey.
platyfolia decora, 1½', olive grn., pur.	

(4) TUBEROUS ROOTED.

Description.—The history of the brilliant-hued race of florists' flowers known as "Tuberous Begonias" is one of the most interesting that the annals of horticulture record, and it proves that there are triumphs in the art of gardening as great as those obtained by the mechanical engineer and the chemist. Limits of space prevent any detailed account of how these popular flowers were produced and have been brought to their present state of perfection, but the subject cannot be entirely dismissed. Thirty-five years ago Tuberous Begonias did not exist, and even five-and-twenty years back no one had any notion that such a magnificent race of plants was being brought into existence. Six species of Begonia, none of them of exceptional merit, have been utilised in creating this family—*i.e.* boliviensis, Veitchii, Pearcei, rosiflora, Davisii, and Clarkei. Of these, the three first have exerted by far the greatest influence, though

it must not be forgotten that Clarkei was the seed parent of Emperor and Vesuvius, the latter a bedding variety of great merit, and still deservedly popular. Messrs. J. Veitch and Sons were the first to raise hybrid Tuberous Begonias, and they sent out Sedenii in 1870, this being the first of numerous hybrids raised by Mr. Seden. It is, however, to the late Mr. John Laing that we are mostly indebted for the modern Tuberous Begonia. He commenced hybridising in 1875, using the three species alluded to, and about half a dozen varieties. Three years later the horticultural world was astonished at the results. In a comparatively short time the Tuberous Begonia leapt into popularity. By carefully selecting the parents, and by rigidly excluding all poor forms, the habit of the plants was improved and the size of flowers increased, until flowers 7" across were exhibited.

During recent years florists have directed their efforts chiefly toward the improvement in form and colour of double Begonias, and to fixing the colours of bedding strains, but improvement in named varieties for pot culture continues, and the Begonia season has been extended. In its double forms the Begonia has not only preserved its identity, but at the same time given remarkable imitations of the Rose, Camellia, Carnation, Petunia, and Hollyhock.

Starting the Tubers.—Where there are necessary conveniences, tubers may be started in February or March by laying them in leaf soil



Photo: Cassell & Company, Ltd.

NEW BLUSH TUBEROUS BEGONIA LADY WHITE.

or Coconut fibre refuse, and placing them in a warm greenhouse or in a frame over a mild hot-

bed. When roots are being freely emitted, pot up the tubers intended for conservatory decoration or exhibition, and put those intended for bedding into pots, boxes, or a bed of soil in a warm pit, according to circumstances and convenience. The latter system is a good one, as air can be readily admitted and the hardening-off process conducted with ease; plants so grown can be lifted and planted out at the end of May or early in June, according to locality. If kept in small

loam, leaf soil, dried cow manure, and sand, form an excellent compost.

Other Cultural Points.—In the case of pot plants it will early become necessary to place these near the glass, to prevent attenuated growth and flimsy foliage, which are the forerunners of poor flowers. Give more root room as this is needed, and pot moderately firmly. When established in their flowering pots, frequent applications of liquid manure will be needed to maintain



Photo: Cassell & Company, Ltd.

NEW WHITE WINTER-FLOWERING BEGONIA MOONLIGHT.

pots till June there is a danger of the plants suffering from drought and also lack of food.

Propagation.—By far the quickest way to raise or increase stock is by means of seeds sown on light soil in a propagating house. Instructions for raising seedlings are given in the sections devoted to Species and Fibrous Rooted Begonias, and as these apply to Tuberous Begonias they are not repeated here. An early start must be made to secure flowering plants by July, but this can be managed if cultivation follows the lines laid down for tubers, but with more warmth afforded in the earlier stages. Cutting up tubers to increase stock is not good practice. By means of spring or autumn cuttings any valuable seedling can be perpetuated.

Soil.—Begonias are not very particular as to soil, but it should be rich and fairly substantial for the production of fine pot specimens. Good

strong growth and ensure plenty of large, richly coloured blooms. Tie out and support the growths so that light and air may reach all parts. As the flowering stage passes, gradually withhold water. When growth has died down the tubers may be either taken from the soil and stored in a cool cupboard, or left in the pots and stored under the stage.

Selection of Double Tuberous Begonias:—

Crimson.—B. R. Davis, Dr. Nansen, J. B. Blackmore, J. T. Bennett-Poë, Leopold de Rothschild, and Lord Llangattock.

Orange Scarlet.—Baron Schröder, Felix Crousse, Henshaw Russell, J. Marshall, General Baden-Powell (p. 111), Mr. W. G. Valentine (p. 111), and Scarlet Perfection.

Salmon.—Ambrose M. Hooper, Chas. Turner, Claribel, Mrs. Lynch, Mrs. Lewis Castle, and Sir John Pender.

Rose and Pink.—Andromeda, Beauty of Bel-

grove, Dr. Jameson, Lady Hampden, La France, Marion Crawford, Pink Perfection, and Rose Laing.

White and Blush.—Alba plena, camelliaeflora, Calliope, Duchess of Fife, Picotee, Octavie, Lady White (p. 113), Lord Roberts (p. 113), Mrs. Tweedie (p. 112), and Virginalis.

Yellow.—Aurora, Duchess of Albany, Lady Emily Dyke, Miss Falconer, Mme. la Baronne de St. Didier, and Rev. E. Lascelles.

Selection of Single Tuberous Begonias:—

Crimson.—Beacon, Firefly, Grant Allen, King of the Begonias, Sir Trevor Lawrence, and W. E. Gladstone.

Orange Scarlet.—Frank Beadle, Hero of Omdurman, Jardin des Plantes, Mr. Cockburn, Mrs. H. G. Murray Stuart, and Prince of Orange.

Salmon.—Duchess of Westminster, Lady Henry Grosvenor, Mrs. L. Lunt, Mrs. L. Morton, Salmona, and Starlight.

Rose and Pink.—Delight, Exquisite, Miss Cannell, Miss Decima Moore, Rose Perfection, and Queen of Roses.

White and Blush.—Miss Masters, Nelly Pritchard, Purity, Snowdrift, Snowstorm, and The Lady.

Yellow.—Gloriosum, Jealousy, Lady Lawrence, Primrose, Queen of Yellows, and Sunshine.

Bedding Varieties.—First-rate bedding varieties, differing from the modern florists' types in having smaller leaves and smaller flowers of a more or less pendent habit, are Vesuvius, worthiana, Lælia, Phosphorescens, and Madame Lamarche, all bright, free flowering, remarkably attractive, and considered by many to be more elegant than the stiffer, larger flowered, erect growing strains.

(5) WINTER FLOWERING.

Description.—Rapid as was the rise of the tuberous Begonia, that of the winter flowering Begonia has been still quicker. Year by year the need for subjects to flower during our long dull winter increases, and as a consequence the florist has turned his attention to Begonias. The discovery of Begonia socotrana by Prof. Balfour in 1880, led to the creation of a distinct race of plants that flower from October onwards; the species itself flowers at midwinter, and retains its flowers until they wither. Crossed with tuberous Begonias it has produced plants of stronger growth, easier culture, and with larger, brighter flowers. Crossed with lynchiana, and more particularly with Dregei, by M. Lemoine, it has given among other fine plants the at present immensely popular Gloire de Lorraine, a hybrid that has already given several colour sports.

Propagation is best effected by cuttings of young growth taken from early started plants, these rooting readily in very sandy soil if placed in a close frame in a propagating house. After the first potting an elevated stage must be provided, for weakly, drawn growth means failure. In most cases it is desirable to pinch the growths twice during the season, and advantage may be taken of this to still further increase the stock. Overpotting is prejudicial, and nothing larger than a 6" pot is necessary. Rich loam and sand are sufficient for compost, but should the loam be heavy or poor, then leaf soil or dried cow manure must be added. Those hybrids having a tuberous Begonia as one parent are all the better if they receive an abundance of air (not draughts) from June to September; indeed, they may be treated as warm greenhouse plants during that period. The

other section requires warmer treatment the year through. A comparatively dry atmosphere through the flowering season helps the flowers to retain their freshness over a long period.

Other Cultural Points.—Although only producing annual stems, these Begonias do not possess a tuberous root in the ordinary sense of the term, but have a rootstock much influenced by socotrana, in which it takes the form of a cluster of fleshy buds. This being so, none of the hybrids will accommodate themselves to the "drying off" system as practised with the true tuberous section, but on the other hand they must be rested by having the water supply reduced, so that these pseudo-tuberous roots are kept plump. The group also resents being rested in a cool house. Plenty of light, unchecked growth, and liberal feeding by means of liquid manure, are the three chief points in cultivating the winter flowering Begonias. An intermediate temperature must be provided, and a moderately moist atmosphere afforded until late autumn. Both thrips and green fly, the former especially, will tax the grower's efforts to keep them at bay, though in these days of vaporising as opposed to fumigation there should be no fear of harm, provided the preventive is applied at frequent intervals.

For table decoration few plants are so charming during winter as small examples in 3" pots, from late struck cuttings, of Begonia John Heal or Adonis, each with a few rose or carmine flowers that are seen at their best under artificial light. In a larger way a fine example of Gloire de Lorraine dropped into a silver vase is extremely effective. It must be remembered that the semperflorens group of Begonias, with fuchsioides, weltoniensis, ascotiensis, Ingramii, and Carrieri, are all useful for flowering in winter. Take cuttings in February and pot on as necessary, treating them pretty much the same as fibrous-rooted varieties in pots, keeping them in cool frames during the summer, but housing them early in autumn.

Principal Species, Hybrids, and Varieties:—

Adonis, 1½', Nov., Jan., car.	John Heal, 1', Nov., Jan., ro. car.
Caledonia, 1', Oct., Mch., wh.	Julius, 1½', Nov., Dec., ro.
Carrieri, 1½', Oct., Mch., wh.	Mrs. Leopold de Rothschild, 1', Oct., Mch., ro.
corallina, 3', Oct., Jan., coral red.	Moonlight, 15", wh. (see p. 114).
Ensign, 1½', Nov., Dec., red.	semperflorens gigantea, 2', Sep., Mch., red.
fuchsioides, 6', Sep., Dec., sc.	socotrana, 1', Dec., Jan., ro.
Gloire de Lorraine, 1', Oct., Mch., ro.	weltoniensis, 1½', Nov., pk.
Gloire de Secaux, 3', Nov., Jan., pk.	Winter Cheer, 1', Nov., Dec., sc.
Ingramii, 1½', Oct., Dec., ro.	Winter Gem, 1½', Nov., Dec., car.

BELAMCANDA.

A cool greenhouse, bulbous plant (*ord.* Iridæ), requiring similar treatment to that afforded Ixia, which see.

Principal Species:—

chinensis, 2', My., Je., yel., red (*syns.* Pardonthus and Ixia chinensis).

Bejaria (see *Befaria*).

Belantheria (see *Brillantaisia*).



Photo: C. Metcalfe.

BELLADONNA LILIES.

BELLADONNA (*see* ATROPA).**BELLADONNA LILY.**

Description.—Deciduous bulbs (*Amaryllis Belladonna*, *ord.* *Amaryllidæ*). The species is not perfectly hardy, but it and its varieties may be grown successfully in the open under certain conditions. An objection to the Belladonna Lily is that blooms and foliage are not produced together.

Propagation.—By offsets in the autumn.

Soil.—Deep, well drained, light loam, under the shelter of a south wall.

Other Cultural Points.—If the soil is poor dig in some well decayed manure, and if of a retentive character add leaf mould and coarse sand. Plant the bulbs in the autumn in clumps of three, about 1' apart. Place a handful of sand round each to prevent it from rotting, and cover with 6" of soil. Protect the bulbs from severe frost during the winter, with a mulching of straw litter or leaves. Remove the covering when the leaves push forth early in the spring, because on the full development of the foliage the flowering is largely dependent. Apply water and liquid manure during dry, hot weather, and as soon as the leaves ripen off they should be removed, and the border raked over. The flower spikes develop late in the summer. Leave the bulbs in the ground, but afford some means of protection in severe weather.

Species and Varieties :—

Belladonna, 1½', *sum.*, — *blanda*, 3', *sum.*, pale
rosy red (*syns.* *pubica*,
rosea, *Coburgia Belladonna*, and *Belladonna*
purpurascens). — *pallida*, 2', *sum.*, flesh.

BELLENDENA.

This Tasmanian shrub (*ord.* *Proteaceæ*) requires the temperature of a greenhouse. Propagation is most readily effected by cuttings in very sandy soil; seeds are sometimes procurable. Soil, peat, light loam, and coarse sand.

Only Species :—

montana, 1½', *Aug.*, wh.

BELLEVALIA.

Pretty spring flowering plants (*ord.* *Liliaceæ*) which are now included with *Hyacinthus*. They are suitable for borders or rock gardens, but few are hardy enough to stand average winters in cold districts without protection. They grow in ordinary soil, and are propagated by offsets or seeds. The best are *comosa* (*see* *Muscari comosum*), *operculata* (*syn.* *B. romana* or *Hyacinthus romanus*), and *syriaca* (*syn.* *H. trifolius*). For others *see* *Hyacinthus* and *Muscari*.

BELLFLOWER (*see* CAMPANULA).**BELL-GLASS.**

A bell-shaped vessel formed of one piece of glass, with a knob or handle on the top. It is made in various sizes, and often supplied with a grooved earthenware saucer into which its mouth fits; when, the groove being filled with water, the bell-glass becomes hermetically sealed, and furnishes a close moisture-laden atmosphere in which cuttings of plants, more particularly *Azaleas*, *Heaths*, and other hard-wooded subjects, readily emit roots. Choice varieties of seeds are also easily raised by its aid, and *Filmy Ferns* find a congenial home under its protecting roof.

BELLIDIASTRUM.

The plant grown under the name of *Bellidiasium Micheli* is now called *Aster Bellidiasium*, and will be found described under that name.

BELLIS. (DAISY.)

Well-known, favourite plants for borders, beds, or edgings (*ord.* *Compositæ*). Propagated by division after flowering, or by seeds sown in spring. Any ordinary garden soil will do, except in the case of *rotundifolia cærulescens*, which is tender, and needs a light, sandy peat.

Principal Species :—

perennis, 3', *My.*, *Je.*, wh., etc. The common Daisy, of which there are many pretty garden forms of various colours, with handsome double flowers and quilled or flat petals. In lines these are very effective. Good varieties are the double *pk.*, red, and wh.; *Alice*, blush; *Longfellow*, *pk.*; *Lord Beaconsfield*, red; *Rob-Roy*, red; *The Bride*, wh.; *Hen and Chickens*, curious; *Dresden China* and *Blushing Bride*, miniature forms; and *aucubæfolia*, with gold-netted leaves.

Other Species :—

integrifolia, 4" to 12", *rotundifolia*, var. *cærulescens*, 2', *Jy.*, bluish.
Ap., wh. *syvestris*, 9", *Je.*, wh.

BELLIUM.

Neat little annual or perennial plants (*ord.* *Compositæ*), suited for rockwork or the front of a select border. The perennials are propagated by division in spring, or by seeds; the annuals by seeds sown in spring. All should have a dry, sandy soil; and *minutum* must have a warm position on the rockery. The principal species are *bellidioides*, 3", *July*, annual, white; *crassifolium*, 6", *June*, half-hardy perennial, pale yellow; *intermedium*, 2", *August*, hardy perennial, white; *minutum*, 3", *August*, hardy perennial, white; and *rotundifolium*, 9", *July*, half-hardy perennial, white.

BELLOWS.

Implements used for dusting flowers of sulphur and other fungicide and insect powders on plants. A simple arrangement, in common use, is made of gutta percha, provided with a nozzle perforated with holes. The receptacle is filled with powder, which is distributed by squeezing the gutta-percha holder. A more elaborate but reliable implement is the "Malbec" bellows. This consists of a receptacle for the powder, and a pair of small hand-bellows in combination. By the aid of the latter light dustings of the fungicide are distributed over affected plants.

BELOPERONE.

A small genus of shrubs (*ord.* *Acanthaceæ*) which are evergreen in character, and require the temperature of a stove. Propagation is effected by cuttings in sandy soil under a bell-glass in brisk bottom heat. The most suitable compost is loam, leaf mould, and sand, with some peat.

Principal Species :—

oblongata, 3', *ro. pur.* *violacea*, 3', *Aug.*, *vio.*

Other Species :—

atropurpurea, 3', *Sep.*, *plumbaginifolia*, 3', *Aug.*,
pur. *bl.*

BENCOMIA.

Low growing shrubs (*ord.* *Rosaceæ*) from the Canary Islands, and named after the last king of Tenerife. The flowers are dioecious (sexes on separate plants), and produced in long spikes. A

moderately light compost, and the temperature of a warm greenhouse, will suffice.

Principal Species :—

caudata, 2', Jy., Aug., grn., pur.

BENINCASA.

This genus consists of two or three species of climbing or trailing plants (*ord.* Cucurbitaceæ), needing a warm and moist atmosphere. Easily raised annually from seed, but of no special value, though the fruits are moderately attractive.

Principal Species :—

cerifera, 10', Jy., Sep., yel. (*syn.* *hispida*).

BERBERIDOPSIS.

An extremely ornamental evergreen shrub (*ord.* Berberidæ), of climbing habit, and very suitable for covering a warm south wall. With some protection, it can be grown against a trellis or similar support. It grows in any good soil; and is propagated by seeds, sown in spring; by cuttings of the young wood at the same season; or by layering the branches in autumn. The only species is *corallina*, which has bright crimson flowers, produced at the ends of the branches. In cold districts it may be grown in a greenhouse without heating apparatus.



Photo : Cassell & Company, Ltd.

BERBERIS STENOPHYLLA

BENTINCKIA.

These noble and handsome Palms (*ord.* Palmæ) require abundance of heat and moisture at all seasons of the year. A compost of good loam and peat or leaf soil suits them if pressed firm. They can be raised from seeds, but these are seldom offered for sale. When young the leaves are entire, but as age and size increase pinnate leaves are produced.

Principal Species :—

Coddapanna, 10' to 20'. *nicobarica*, 60' to 70'.

BERARDIA.

This genus is comprised of evergreen shrubs (*ord.* Bruniaceæ), which require a greenhouse temperature. Stock may be increased by cuttings and division. The plants will thrive in any fertile soil.

Principal Species :—

globosa, 2', Je., wh. *palceacea*, 1½', Jy., wh.
microphylla, 1½', Jy., wh. *phylicoides*, 2', Jy., wh.

[NOTE.—*Berardia* of Villiers (only species sub-*acaulis*) belongs to the Compositæ, and is a different genus entirely.]

Benthamia (see *Cornus*).

BERBERIS. (BARBERRY.)

Description.—Highly ornamental evergreen or deciduous shrubs (*ord.* Berberidæ), of erect or trailing habit, and adapted for many purposes in the garden or shrubbery. Almost all have ornamental foliage, and the greater number have pretty flowers, followed, in many cases, by attractive berries. The pinnate-leaved species are often known as Mahonias, but are now included with the Berberises. These are marked ev.

Propagation.—By seeds, sown in autumn or spring; by suckers or layers, in autumn; or by cuttings of ripened wood, placed in a frame in autumn.

Soil.—The greater number thrive well in any ordinary soil, but some of the choicer species ought to be accommodated with a compost of loam, peat, or leaf soil, and sand.

Other Cultural Points.—It is difficult to discriminate between so many beautiful plants, either in selecting the best of the species, or in stating to what purpose they are most adapted. They can be used almost anywhere. One may

be specially named on account of its foliage as being one of our best dark-leaved shrubs; this is *vulgaris foliis-purpureis*. Many of the dwarfier species are handsome as permanent bedders or on rockwork.

Principal Species :—

Aquifolium, 6', Ap., yel. (*syn.* *Mahonia Aquifolium*). One of the most useful of all the *Berberises*, growing in any soil, and producing Plum-coloured berries. It is largely used for game coverts. Several vars., of which *gracilis*, *Herveyi*, and *moseriana* are good. The var. *fascicularis* is also known as *B. fascicularis* and *Mahonia fascicularis*.

buxifolia, 8', Mch., yel., ev. A very neat growing shr., of erect habit and with small flowers. The dwarf form called *nana* makes a good shr. for the rockery (*syns.* *dulcis*, *rotundifolia*, and *microphylla* [of some]).

Darwinii, 3' to 10', My., or., ev. Perhaps the prettiest Barberry we have. Very ornamental, with its glossy, spiny leaves and yel. blooms.

stenophylla, 3', My., yel., ev. This (*see* p. 118) is reputed to be a hybrid between *Darwinii* and *empetrifolia*, and is a handsome plant, effective because of its foliage, flowers, and dark pur. berries. There are now some pretty seedling forms.

vulgaris, 7' to 18', Ap., yel. Its great beauty lies in its or. sc. fruit, which is sometimes used for preserving. There are a good many forms, including some with fruit of a different colour from the type: blk., wh., vio., pur., and yel. fruited plants can be had. The pur. leaved form is very effective. Many of the reputed species can only be considered forms of *vulgaris*.

wallichiana, 6', My., yel., ev. This is a handsome Barberry, with pretty leaves and flowers, and large vio. pur. berries (*syn.* *Hookeri*).

Other Species :—

<i>actinacantha</i> , 3', Je., yel., ev.	(<i>syns.</i> <i>elegans</i> , <i>glauca</i> , <i>glaucescens</i> , etc.).
<i>aristata</i> , 6', My., yel. (<i>syns.</i> <i>carulescens</i> and <i>macrophylla</i>).	<i>nepalensis</i> , 4', Je., yel., ev. (<i>syn.</i> <i>japonica</i> , etc.).
<i>asiatica</i> , 6', My., yel., ev.	<i>nervosa</i> , 3', Je., yel., ev. (<i>syns.</i> <i>Mahonia nervosa</i> , <i>B.</i> and <i>M. glumacea</i>).
<i>canadensis</i> , 5', My., yel.	<i>repens</i> , 2', My., yel., ev. (<i>syn.</i> <i>M. repens</i>).
<i>concinna</i> , 6', Je., or., ev.	<i>ruscifolia</i> , 5', My., grn., yel., ev.
<i>congestiflora</i> , 7', Ap., yel.	<i>Sieboldii</i> , close to <i>vulgaris</i> .
<i>crataegina</i> , 5', My., yel.	<i>sinensis</i> , 5', My., yel. (<i>syns.</i> <i>chinensis</i> and <i>monosperma</i>).
<i>cretica</i> , 3', Ap., yel.	<i>Thunbergii</i> , 3', Ap., yel. (<i>syn.</i> <i>Maximowiczii</i>).
<i>emarginata</i> , 6', My., yel., ev.	<i>virescens</i> , 3', My., grn. (<i>syns.</i> <i>aristata</i> , <i>belstani-ana</i> , etc.).
<i>empetrifolia</i> , 2', My., yel., ev. (<i>syns.</i> <i>cuneata</i> and <i>revoluta</i>).	
<i>Fortunei</i> , 2', Jy., yel., ev.	
<i>Fremonti</i> , 4', My., yel. (<i>syn.</i> <i>trifoliata</i>).	
<i>ilicifolia</i> , 3', Jy., yel., ev.	
<i>Lycium</i> , 6', Je., yel., ev.	

BERCHEMIA.

With the exception of *volubilis*, which is a hardy deciduous climber from Carolina, these are evergreen greenhouse twiners (*ord.* *Rhamnæ*), that may be propagated by cuttings or seeds. A compost of loam, peat, and sand will be found suitable.

Principal Species :—

floribunda, 10', Jy., wh. *volubilis*, 12', Jy., grn., lineata, 8', Je., grn. wh.

BERGAMOT.

A delicious perfume extracted from the rind of the fruit of *Citrus Aurantium Bergamia*, a small

member of the Orange family. In its best form it is produced by rolling the fruit over a vessel studded with sharp spikes, the oil liberated from the broken glands being collected in the hollow handle. Poorer qualities are obtained by rasping and pressing the rind. Other plants, by reason of their aroma, have received the name of Bergamot, notably the handsome *Monarda didyma* of gardens, *Mentha odorata*, and the Wild Bergamot (*Monarda fistulosa*).

BERGERA (*see* MURRYA).

BERGIA.

A genus of shrubs or sub-shrubs (*ord.* *Elatinæ*) principally from India, South Africa, and Australia, and of little value for the garden. They require greenhouse or stove temperature, and light, rich soil. The genus is propagated by seeds or cuttings in heat.

BERKHEYA.

A South African genus (*ord.* *Compositæ*) comprising greenhouse evergreens and herbaceous biennials. The former are raised from cuttings, and the latter by division and seeds. A light loam with coarse sand forms an excellent rooting medium.

Principal Species :—

Adlamii, 6', yel., herb. *lanceolata*, 1½', Jy., yel. *grandiflora*, 2', Jy., yel. *purpurea*, 3', Aug., pur.

Other Species :—

cernua, 1', Je., yel. *palinata*, 2½', Jy., yel. *cuneata*, 2', Jy., yel. *pinnata*, 1', Aug., yel. *cynaroides*, 1½', Je., yel. *spinosissima*, 2', Jy., yel. *incana*, 1½', Aug., yel. *uniflora*, 3', Jy., yel. *obovata*, 2', Jy., yel.

BERLANDIERA.

A herbaceous, perennial plant (*ord.* *Compositæ*), needing the shelter of a greenhouse. It is raised from seeds sown in spring. The flower heads are remarkable for their persistence. Loam, leaf soil, and sand meet its requirements so far as compost is concerned.

Principal Species :—

tomentosa, 2', My., Je., dull yel.

BERRY.

For descriptive purposes botanists have divided the various fruits or seed vessels into groups, and "berry," or "bacca," is the general title of one group. A berry is a fruit full of pulp, frequently edible, either by man or beast, and containing the seeds in the pulp. Common examples of the berry are seen in Grapes, Currants, Tomatoes, Gooseberries, and Potato apples. The Raspberry and Strawberry fruits are not true berries, but, in botanical language, the former is a combination of achenes and drupels and the latter a fleshy receptacle.

BERRYA (also spelled BERRIA).

A small Indian tree (*ord.* *Tiliacæ*) that may be accommodated in a stove, and potted in loam and peat. It yields the "Trinconalee Wood" of commerce.

Only Species :—

Ammonilla, 30', Aug., wh.

BERTEROA.

Hardy or half-hardy flowers (*ord.* *Cruciferae*), similar to the Alyssums in appearance, and now included with them. They are propagated by seeds

popular kitchen garden crops that yield crimson red roots, so familiar to us when sliced and forming an ingredient of the salad bowl. (See BEET.) There are other species, however, and all but trigyna are hardy biennials, needing to be sown in March or April in deeply cultivated soil. Trigyna is a herbaceous perennial.

Principal Species:—

Cicla, 6', Aug., grn.	Aug., red (Victoria Beet).
— variegata.	
crispa, 6', Aug., grn.	rubra, 4', Aug., grn.
hortensis metallica, 5',	trigyna, 3', Jy., wh.

BETONICA.

The species included under this name are now referred to *Stachys* (*ord.* Labiatæ). The Wood Betony (*officinalis*) is the best known representative under that generic title, and is now named *Stachys Betonica*, which see. It was at one time used medicinally, but is now neglected.

BETULA. (BIRCH.)

Description.—Graceful and ornamental trees (*ord.* Cupulifera), of which our native *Betula alba*, the Silver or Common Birch, is one of the very best. All those named are probably hardy, and all are ornamental at any season. The flowers, which are in catkins, appear at the same time as the leaves, and are succeeded by small winged nuts. Our native Birch is a capital tree for exposed positions, and can be grown on very poor dry soil. It is one of the chief ornaments of some parts of the Highlands of Scotland.

Propagation.—Principally by seeds, sown in April or when ripe, and slightly covered with fine, sandy soil; but in the case of the varieties, or the less common species, by grafting or by suckers.

Soil.—Nearly all the species can be grown in either a moist or a dry soil, but *nana* and *pumila* prefer one of a boggy nature.

Principal Species:—

alba, 60', Mch., wh. Our beautiful native Silver Birch, which only reaches the height named when in the most favoured places. There are a number of forms and varieties which are more or less distinct. For ornamental planting probably the best are *foliis-variegatis*, which has leaves blotched with a creamy wh.; *laciniata pendula*, with nicely cut leaves and a drooping habit; *pendula*, a drooping habited form of much beauty; and *purpurea*, which has its leaves of a fine metallic pur. above. Other forms are *dalecarlica*, *macrocarpa*, *pubescens*, *pontica*, and *urticaefolia*, besides several vars. of some of these.

fruticosa, 6', Feb., etc. This species is recommended for its dwarf habit, which makes it suitable for positions where *alba* would be too tall. The var. *Gmelini* is sometimes known as *divaricata*.

lenta, 70'. A fine forest tree in suitable localities. It is known as the Black, Sweet, or Cherry Birch in North America, whence it comes. The tree somewhat resembles the Cherry (*syn.* *carpinifolia*).

nana, 1' to 3'. A beautiful miniature Birch for the rock garden or artificial bog. It is a pretty plant, which is rarely seen above the height mentioned.

Beteke (see *Plectritis*).

Betel Nut (see *Piper*).

Betony (see *Stachys*).

Biancea (see *Casalpinia*).

papyrifera, 70'. Another forest tree, interesting from its chalky wh. outer bark (*syns.* *amygdalifolia*, *papyracea*, *platyphylla*, etc.).

populifolia, 30'. A Canadian tree, resembling *alba*, but less vigorous in growth, and thus suited for some places where a small tree of its character is required (*laciniata* and *pendula* are vars.).

Other Species:—

<i>alpestris</i> .	<i>nigra</i> , 60', Jy. (<i>syns.</i> <i>rubra</i> , <i>canescens</i> , etc.).
<i>davurica</i> , 30', Jy.	<i>occidentalis</i> , 10'.
<i>humilis</i> , 6', Mch. (<i>syn.</i> <i>fruticosa</i> [of Wats.:]).	<i>pumila</i> , 6', My. (<i>syns.</i> <i>dahurica</i> [of gardens], <i>rotundifolia</i> , etc.).
<i>lutea</i> , 20', My. (<i>syns.</i> <i>excelsa</i> and <i>persicæfolia</i>).	
<i>Maximowiczii</i> , 30'.	

BIARUM.

Hardy, spring flowering, tuberous perennials, allied to *Sauromatum*, and having the habit of *Arum* (*ord.* Aroidæ). The spathes are blackish purple or some similar dusky shade. They are propagated by offsets, and may be grown in any friable, well-drained garden soil, in full exposure or slightly shaded.

Principal Species:—

<i>angustatum</i> , 6'', blk. pur.	<i>Pyrami</i> , 6'', blk. pur.
(<i>syn.</i> <i>Ischarum angustatum</i>).	<i>Spruneri</i> , 6'', blk. pur.
<i>crispulum</i> , 4'', blk. pur.	<i>tenuifolium</i> , 6'', Je., br. pur. (<i>syns.</i> <i>gramineum</i> , <i>constrictum</i> , and <i>Arum tenuifolium</i>).
<i>eximium</i> , 6'' bl. pur.	
<i>Kotschyi</i> , 4', blk. pur.	

BIDENS.

The Bur Marigold. Half-hardy or hardy annual and perennial plants (*ord.* Composite), few of which are worth growing in the garden. They are allied to *Cosmos*, and bear some resemblance to that genus. A few of the best are named: Increased by seed sown under glass in spring for the annual and biennial species, and by division for the perennials. They can be grown in ordinary soil, but thrive well in that of a sandy nature enriched with manure.

Principal Species:—

atrosanguinea, 3', Jy., blk. crim. A neat half-hdy. per. with tuberous roots, and now called *Dahlia Zimapani*.
grandiflora, 3½', Jy., yel. A pretty hdy. ann. for the border (*syns.* *serrulata* and *Cosmos lutea*).
humilis, 2', Jy., yel. A per., but best treated as an ann. It has pretty foliage.

Other Species:—

<i>arguta</i> , 2', Je., yel., half-hdy. per.	(<i>syn.</i> <i>Coreopsis feruifolia</i>).
<i>bipinnata</i> , 2', Jy., yel.	<i>procera</i> , 7', Nov., half-hdy. per.
<i>feruifolia</i> , 2', Aug., yel.	

BIDWILLIA.

A little known greenhouse bulb (*ord.* Liliacæ) from Australia. It has white flowers, and blooms about May. The one species grown is named *glaucescens*. It may be cultivated in any ordinary greenhouse in light soil, enriched with manure. It is increased by offsets removed when at rest, or by seeds sown in heat when ripe.

BIEBERSTEINIA.

A very small genus of half-hardy or hardy herbaceous perennials (*ord.* Geraniacæ) with yellow or white flowers. The only species introduced at present is *Emodii* (*syn.* *odora* of Royle), which grows about 1' high, flowers in May, and has yellow blooms. It is propagated from seeds, sown in a little heat in spring; or by

cuttings, placed under a glass at the beginning of summer. A dry soil is required for this plant.

BIENNIALS.

Plants which take two years in which to germinate, produce flowers, mature, and die. Under favourable conditions Biennials sometimes become converted into perennials, notably those cultivated in warm houses. Again, Biennials may be treated as annuals by sowing early in the year, as is the case with *Coreopsis grandiflora*, sown in heat in February. Many of our most valuable vegetables are Biennials, but by treating them as annuals we take advantage for our own sustenance of the food supply which the careful plant had been husbanding for its own nutrition during its flowering period.

BIFRENARIA.

Epiphytal Orchids (*ord.* Orchidaceæ), requiring the temperature and moisture of the East Indian house. Most of them were referred to *Maxillaria* at one time, but their flowers are in racemes, not solitary as in that genus. They are propagated by offsets and division. Fibrous peat and sphagnum, mixed with finely broken crocks or charcoal, will form a suitable compost. Elevate the pseudobulbs above the pots or baskets, and drain well.

Principal Species :—

<i>atropurpurea</i> , 1', dark pur. (<i>syn.</i> <i>Maxillaria atropurpurea</i>).	<i>M. pungens</i>). Has held its ground for a century.
<i>aurantiaca</i> , 9", Sep., or. pur. (<i>aurantiaca</i> of gardens, <i>see inodora</i>).	— <i>alba</i> , 1', Sep., wh., tip red.
<i>Charlesworthii</i> , 9", with red br. spots. Allied to <i>racemosa</i> .	— <i>buchaniana</i> , 1', Sep., vio., pur., grn., yel.
<i>Harrisonia</i> , 1', Sep., wh., vel. tips (<i>syns.</i> <i>Maxillaria Harrisonia</i> and	<i>inodora</i> , 9', My., grn. spotted (<i>syn.</i> <i>aurantiaca</i> of gardens).
	— <i>xanthina</i> , 9', My., yel.
	<i>vitellina</i> , 1', Jy., yel., pur.

Other Species :—

<i>aureo-fulva</i> , 1', Oct., or. leucorrhoda, wh., ro. veins.	<i>parvula</i> , tawny yel., lip pur.
<i>longicornis</i> , or. br.	<i>racemosa</i> , straw colour, lip wh.
<i>melicolor</i> , honey colour, red.	<i>tyrianthina</i> , vio. pur.

BIGELOVIA.

Hardy, shrubby, sub-shrubby, or herbaceous plants (*ord.* Compositæ), formerly referred to *Chrysanthamnus*, *Linosyris*, etc., by different authorities. The habit and small yellow flower heads show a transition towards *Solidago*. They are propagated by cuttings of half-ripened, leafy shoots in pots of sand or sandy soil under hand-lights, or in a frame during the latter part of summer. Any well drained friable garden soil will suit them.

Principal Species :—

dracunculoides, 3', Sep., yel., hdy. sub-shr.
— *albicaulis*, 2', stems wh.
Howardii, low shr. (*syn.* *Linosyris Howardii*).
nudata, 1' to 2', Sep. A hdy. per. herb.
paniculata. A shr. with flower heads less than 1/2" long.

BIGNONIA.

Description.—A genus of stove climbers (*ord.* Bignoniaceæ). When allowed to climb to the

roof of a tall house and become well established they form some of the most gorgeous of plants. Leaves divided into three leaflets, or the middle one may form a tendril or hook for climbing; usually they are compound, and rarely reduced to one leaflet. The flowers vary greatly in colour, from white to purple, red, scarlet, yellow, and orange.

Propagation.—By imported seeds sown in stove heat. Also by cuttings of short side shoots taken off when they are getting firm, and inserted in sand in a propagating case, or in pots under a bell-glass. Also by layers. *Capreolata* may be increased by root cuttings.



BIGNONIA TWEEDIANA.

Soil.—Equal parts of fibrous loam and peat will meet the requirements of most of them, using sufficient sand to render the compost porous and friable.

Other Cultural Points.—Like many other tall-growing climbers, most of the Bignonias succeed best when planted out in prepared borders and the stems trained up the pillars or rafters of high houses, where they will be exposed to plenty of sunshine. The cultivator must have patience till the plants make strong, woody stems. Though most of them require stove heat with a minimum of 60° to 65° in winter, several succeed better in a warm, airy greenhouse, and this number might be increased by trials of different species. *Capreolata* is the only one that can claim to be hardy in warm situations against a wall, and this only applies to the South of England.

Biglandularia (*see Sinningia*).

Principal Species :—

buccinatoria, 15', Jy., Aug, grh., red, or throat (*syns.* Cherere, Kerere, and heterophylla).
caprolata, 15', Sum., hdy. or half-hdy., sc.
— atrosanguinea, 15', Je., hdy. or half-hdy., red pur.
jasminoides (*see* Tecoma).
magnifica, st., mauve to pur. crim.

Other Species :—

requinoxialis, 40', Je., st., yel.
alliacea, 10', st., yel.
apurensis, 10', st., yel.
argyreo-violaceus.
articulata, leaves wh. veined, vio. when young.
aurantiaca, st., or.
bijuga, 6', st.
Carolinae, 10', My., grh., cream.
Chica, 10', st.
chrysantha (Tabebuia).
chrysoleuca, 10', st., yel. wh.
Clematis, 15', st.
crenata, 10', st.
crucigera, 20', cool grh., yel., sc.
decipiens, 10', st.
diversifolia, 10', st.
elongata, 8', st., pur.
floribunda, 12', st., wh.
grandiflora (*see* Tecoma).
incarnata, 4', st., wh., or.
jasmminifolia, 10', st., wh.
laurifolia, 20', st.
Lindleyi, 10', st., variegated (*syn.* picta).
littoralis, st., pk., red.

purpurea, 15', st., pur.
rugosa, Oct., st., yel.
speciosa, 20', Ap., My., st., pk. Flowers from the previous summer's shoots (*syn.* picta).
tweediana, 20', Je., Aug., grh., yel.
venusta, 20', Sep. to Dec., grh., or. (*syn.* Pyrosetegia ignea).

lucida, 10', st.
microphylla, 15', st., wh. (*syn.* Catalpa microphylla).
mollis, 10', st.
mollissima, 10', st.
multifida, 10', st.
pallida (*see* Tabebuia leucoxyala).
perforata, Aug., st.
pubescens, 15', Je., st., yel.
quadrangularis, 10', st.
radicans (*see* Tecoma).
regalis, st., red, yel.
reticulata, st.
rodigasiana, leaves variegated wh., rosy when young.
Roezlii, st.
salicifolia, 10', st., yel.
spectabilis (*see* Tabebuia spectabilis).
spicata, st.
staminea, 10', st., yel.
Unguic-cati, 10', Ap., st., yel.
variabilis, 10', st., yel., wh.

suckers or division, the former being the better method. Good fibrous loam and peat in equal proportions, or half decayed leaves instead of peat, suit. Use sufficient sand to make it porous. During the growing period water the plants freely; and syringe to keep them clean; less water will be sufficient in winter, but the roots must be kept moist. Temperature in winter, 55° to 60°; summer, 60° to 75°.

Principal Species :—

Bakeri, 1½', grn., vio.
iridifolia, 1½', Mch., sc., yel., crim.
Lietzei, rosy pk., grn.
There is a double var. of this, the first in the order.
Moreli, 1', Feb., pk., bl., ro. A handsome basket plant.
nutans, 1½', win., yel., ro., bl.

roseo-marginata (now *Quesnelia rufa*).
thyrsoides, 1', Nov., sc.
— spendida, 1', Nov., sc., tip vio.
vittata, 2', red, vio., grn. (*syns.* Leopoldii, moreliana, pulcherrima, rohaniana, zonata).
zebrina, 1' 6", Je. Leaves zoned grey and br. salmon (*syn.* *Helicodea zebrina*).



BILLBERGIA ROSEO-MARGINATA (NOW *QUESNELIA RUPA*).

Other Species :—

amena (*see* speciosa).
andegavensis, red, indigo.
angustifolia, red.
baraquiniana, wh., grn.
bifrons, red, yel.
Binoti, 1½', st.
breauteana (*see* vittato-Bakeri).
Cappei (*see* vittato-Bakeri).
Chantini, sum., red, yel.
chlorosticta (*see* Saundersii).
clavata, 1½', Feb., st., bl.
cruenta, 1', Aug., bl., red.
elegans (*see* speciosa).
Enderi (*see* *Quesnelia Enderi*).
Euphemiae, dark pur., grn.
Glaziovii, red (*see* *Quesnelia strobilispica*).
glymiana (*see* Moreli).
liboniana, 1', Aug., bl.
macrocalyx, 1½', bl., grn.
marmorata, bl.
moreliana (*see* vittata).
pallida (*see* speciosa).

polystachya (*see* *Aechmea distacantha*).
portena, 3', sum., grn.
purpurea, Oct., ro., pur.
purpureo-rosea, Nov., ro., pur.
pyramidalis, 2', Feb., crim.
quintutiana (*see* Saundersii).
rufa (*see* *Quesnelia rufa*).
sanderiana, grn., tipped bl.
Saundersii, bl.
speciosa, 1½', car., vio.
— palleseus, 1½', win., wh., grn., vio.
variegata, 2', pale grn., tip indigo.
vittata amabilis, 2', bl.
— formosa, 2', or. (*syns.* formosa and zonata of gardens).
vittato-Bakeri, 1½', bl.
Wetherelli (*see* Moreli).
zonata (*see* vittata).

A number of species are now referred to other genera, such as *Tecoma*, *Catalpa*, *Stereospermum*, and *Tabebuia*.

BILBERRY (*see* *VACCINIUM*).

BILL or BILLHOOK.

A hooked chopping instrument fitted with a short handle for cutting firewood or sharpening stakes; and with a long handle for pruning hedges.

BILLARDIERA (*syn.* *LABILLARDIERA*).

Evergreen, climbing shrubs (*ord.* Pittosporaceae), and ornamental subjects for greenhouse culture on account of their flowers or berries. They are propagated by seeds in a warm greenhouse; and by moderately firm shoots in early summer, inserted in sand and placed under a bell-glass. Fibrous loam and peat, with a good dash of sand, will suit them.

Principal Species :—

cymosa, 2', vio., cl.
longiflora, 20', sum., grh., yel., changes to pur.
Berries bl. (*syn.* ovalis).

Other Species :—

angustifolia (*see* scandens).
daphnoides, 10', My., yel., pur.
fusiformis (*see* Sollya heterophylla).

ovalis (*see* longiflora).
parviflora, 12', Jy., bl.
scandens, 12', Aug., pur. (*syn.* angustifolia).

BILLBERGIA.

Stove herbs (*ord.* Bromeliaceae). Leaves crowded together in tufts, covering the very short stem. Flowers highly ornamental. Propagation is by

BINDWEED (*see* BEARBIND).**BIOPHYTUM.**

A group of plants closely allied to *Oxalis* (*ord.* Geraniaceæ), and separated from that genus on account of their pinnate and sensitive leaves. When touched or shaken the leaflets close up like those of the Sensitive Plant, though a little more slowly. Propagation is effected by seeds, which are abundantly produced. Light, sandy loam, with a little leaf mould, makes a suitable compost, in well-drained pans.

Principal Species :—

proliferum, 6', st., yel.

sensitivum, 6", Jy., st., yel. (*syn.* *Oxalis sensitiva*).

BIOTA (*see* THUJA).**BIRCH.**

A most graceful tree of great beauty. There are several species, which will be found in detail under *Betula*, the botanical name, *Betula alba* being that by which our native Silver Birch is known to botanists.

BIRDS.

Useful.—Many British birds are entirely harmless to garden crops, and others, while highly serviceable, are only harmful during the fruiting season of certain crops, and must therefore be classed as useful. Harmless yet valuable birds in the garden include the Spotted Fly Catcher (*Muscicapa grisola*) and the Pied Fly Catcher (*M. luctuosa*), Cuckoo (*Cuculus canorus*), Hedge Sparrow (*Accentor modularis*), Robin (*Erythra rubicula*), the Chimney Swallow (*Hirundo rustica*), the Martin (*Chelidon urbica*), the Common Creeper (*Certhia familiaris*), the Wren (*Troglodytes europæus*), the Nuthatch (*Sitta europæa*), the Willow Warbler (*Phylloscopus trochilus*), the Chiff-chaff Warbler (*S. hippolais*), the Hedge Warbler (*Salicaria Phragmites*), the Gray Wagtail (*Mortacilla boarula*), and the Pied Wagtail (*M. Yarrellii*). All the above are insectivorous birds and should be encouraged within the precincts of the garden. The titmice (*Parus*) are occasionally blamed for destroying the buds of fruit trees, but they are after insects in the same, and the birds may be driven away during the time the buds are preparing to open. This also applies to the Yellow Hammer (*Emberiza citrinella*), the Chaffinch (*Fringilla cœlebs*), the Goldfinch (*Carduelis elegans*), and the Siskin (*C. spinus*), which are granivorous birds, and may be kept off seedbeds by netting. The Blackbird (*Merula merula*) and the Song Thrush (*Turdus musicus*) feed largely upon slugs and snails. They should be kept from Cherries, Strawberries, Raspberries, etc., by netting. Owls and the Magpie (*Pica melanoleuca*) destroy mice, voles, and young rats, and should be encouraged to breed in the vicinity of gardens by leaving them unmolested in Ivy-covered trees, and out-houses or ruins, also in holes in rocks, trees, or in dovecoats where they may take up their quarters. Certain birds that feed on grubs, leather jackets, wireworms, beetles, cockchafers, and other pests, may be tamed and kept in gardens. These include

Billiottia of Brown (*see* *Agonis*).

Bird Cherry (*see* *Prunus*).

Bird's Foot Fern (*see* *Pellæa Ornithopus*).

Bird's Foot Trefoil (*see* *Lotus*).

Bird's Nest Fern (*see* *Asplenium Nidus*).

the common Rook (*Corvus frugilegus*), Jackdaw (*C. monedula*), Chough (*Fregilus graculus*), the Common Gull (*Larus canus*), possibly the Laughing Gull (*L. ridibundus*), and Lapwing or Peewit (*Vanellus cristatus*). The Partridge (*Perdix cinerea*), Pheasant (*Phasianus colchicus*), and Starling (*Sturnus vulgaris*) have been proved to feed largely on the same food as Crows, and need only be driven away from green vegetables in winter when snow is on the ground and food scarce. Poultry may be permitted in orchards and other places, as they feed largely on grubs.

Harmful.—The House Sparrow (*Passer domesticus*) is the worst depredator of all the feathered tribe in gardens. It destroys Lettuces, young Peas, Crocuses, Carnations, Primroses, the buds of Currant and Gooseberry bushes, etc., and should be destroyed by all or any available means, or driven away by depriving it of shelter in Ivy, and stopping up all holes where it may breed. The Bullfinch (*Pyrrhula europæa*) is very destructive to the buds of Apple and other fruit trees in spring, and should be reduced by shooting or be driven away. The Wood Pigeon (*Columba palumbus*) is destructive to Peas, Cabbages, and young vegetables generally during dry seasons, and is a worse pest to vegetables in winter. It also destroys Gooseberries. Shooting is the best remedy.

BISCUTELLA.

Buckler Mustard. Hardy annual or perennial flowers (*ord.* Cruciferae) of little horticultural value. All have yellow flowers. The perennials may be used in rock gardens where a large collection of plants is wished, but both they and the annuals are principally of botanical interest. The best are named below, and are perennials unless indicated as annuals. Propagation is by seeds, sown in spring in the open; the perennials by division also at that season. Common soil, but in a dryish position in sun.

Principal Species :—

coronopifolia, 6', Je.

lævigata, 1', Je.

sempervirens, 1', Je.

stenophylla, 1', Je.

Other Species :—

ambigua, 1', Je.

columnæ, 1', Je., ann.

lyrata, 1½', Je., ann.

maritima, 1½', Je., ann.

BISERRULA.

Hatchet Vetch. A hardy annual (*ord.* Leguminosæ). The only species introduced is *pelecinus*, which grows about 1' high, blooms in July, and has purple flowers. It can be grown from seeds sown in the open in April, and will thrive in any ordinary garden soil which is not too heavy, although it prefers one of a sandy nature (*syns.* *leiocarpa* and *pelecina*).

BISMARCKIA.

An ornamental stove Palm (*ord.* Palmæ) with the habit of a Pritchardia. It is propagated by imported seeds. Sound fibrous loam, with a fourth of leaf mould and a good dash of sand, will answer for compost. Temperature in winter, 65° to 70°; in summer, 80° to 90°. *Nobilis* is the only species.

BIVONÆA.

A hardy annual (*ord.* Cruciferae) with slender stems, branched from the base; the lower leaves stalked, and the upper ones grasping the stem.

Birthwort (*see* *Aristolochia*).

Propagation is effected by seeds sown in the open, in ordinary garden soil. Lutea, 6", April, yellow, is the only species introduced.

BIXA.

Economic stove trees (*ord.* Bixineæ) with heart-shaped, simple leaves and pink or purple flowers. They are propagated by shoots of mature wood in pots of sandy soil, plunged in a propagating case or placed under a bell-glass in a warm house or pit. Two-thirds good loam, one-third peat, and sand, make a suitable compost. The orange red, pulpy covering of the seeds is used for dyeing or colouring milk and cheese, and in the preparation of chocolate.

Principal Species :—

orellana, 30', sum., pk.
— acuminata, 20', Jy., pur. (*syn.* purpurea. This has a wh. sub-var., alba)
urucurana, 20', Jy., pk.

BIZARRE.

A French term implying fantastic. It is generally applied to Carnations with two contrasting colours radiating from the centre on a white ground; and also to Tulips.

BLACKBERRY.

Description.—The common Blackberry or Bramble (*Rubus fruticosus*, *ord.* Rosaceæ) grows wild in all parts of England, and the delicious fruit is highly appreciated in the autumn. Some attention has been paid to the Blackberry as a garden fruit, since the introduction of several large fruited varieties from America. Their flavour, however, is not superior to the wild British species. For the forming of game coverts, and furnishing otherwise waste ground, Blackberries are useful.

Propagation.—Seeds in the case of new varieties. Also from suckers taken from old stools, cuttings, and layers. If the points of the shoots are pegged into the soil, they root readily, and may then be severed and planted.

Soil.—In a wild state the Blackberry flourishes in most soils, but to get the best results under cultivation, a deep, moist, and rather retentive medium is the best.

Other Cultural Points.—The chief care with Blackberries under cultivation is to avoid overcrowding, by thinning out the old growths. They may be planted against walls and fences in sunny positions, and will give a return where other fruits would fail. Cut away old shoots after fruiting, remove weakly suckers, and lay in strong growths thinly and evenly.

Varieties :—

Early Harvest, medium size, early and prolific.
Lawton, large fruit, prolific.
Lucetia, a large American var.
Parsley-leaved, free climber for fences and old trees, large, fine flavoured fruit (*see figure*).
Wilson Junior. One of the best. Glossy fruit, early, and prolific.

BLACK FLY (*see* APHIDES).

Bitter Almond (*see* *Prunus* [*Amygdalus*] *communis amara*).
Bitter-sweet (*see* *Solanum Dulcamara*).
Bitter Vetch (*see* *Orobis*).

BLÆRIA.

Dwarf, evergreen bushy shrubs allied to the Heaths (*ord.* Ericaceæ), and thriving under similar treatment. The leaves are Heath-like, and the small flowers pink or purple. Propagation is effected by cuttings of young shoots under a bell-glass. Sandy fibrous peat will answer for compost, under greenhouse treatment.



BLACKBERRY, PARSLEY-LEAVED.

Principal Species :—

articulata, 1', My., grh., pk.	ericoides, 2', Aug., Oct., grh., pur. (<i>syn.</i> <i>Erica orbicularis</i>).
bracteata (<i>syn.</i> <i>Sympieza capitellata</i>).	fasciculata (<i>see</i> <i>Sympieza</i>).
ciliaris (<i>see</i> <i>Grisebachia ciliaris</i>).	muscosa, 1', Je., Aug., grn.
dumosa, 2', grh.	purpurea, 2', My., Je., grh., pur.

BLAKEA.

Evergreen stove plants (*ord.* Melastomaceæ) of an ornamental character. They are propagated by cuttings of the young shoots after they get sufficiently firm at the base, inserted in sand and covered with a bell-glass, or plunged in a propagating case. Peat and fibrous loam in equal proportions, with a good dash of sand, form a suitable compost. They require a plentiful supply

Black Bryony (*see* *Tamus communis*).

Blackburnia (*see* *Zanthoxylum*).

Black Maidenhair (*see* *Asplenium Adiantum nigrum*).

Black Pine (*see* *Pinus austriaca*).

Black Thorn (*see* *Prunus spinosa*).

Bladdernort (*see* *Urticularia*).

of water in spring and the first half of summer. Summer temperature, 65° to 70°; winter, 60° to 65°.

Principal Species :—

quinquenervia, 10', Je., trinervia, 8', Je., ro. flesh, wh.

BLANCHING.

The process by which the tough green stems and growths of Celery, Leeks, Endive, Lettuces, etc., become converted into the white, nutty food-stuffs which form such an agreeable addition to the salad bowl and dinner table. It is performed in various ways, with different materials, according to the position the subject to be blanched occupies; but all have the same end in view, viz. the exclusion of light, and consequent prevention of the formation of chlorophyll. Lettuces are blanched by tying the leaves together with a piece of raffia; Cabbages, by simply bedding a broken leaf over their hearts; Celery and Leeks, by partially covering with soil; and Endive, by tying like Lettuces, covering with an inverted flower pot, earthenware saucer, or piece of slate. Rhubarb and Seakale are blanched by forcing in a heated, darkened chamber, or by covering with large pots in the open ground.

BLANDFORDIA.

Handsome Liliaceous plants (*ord.* Liliaceæ) allied to Hemerocallis and Funkia, but in outward appearance more resembling Cyrtanthus, though very different in structure. The flowers are funnel-shaped and drooping, and range from yellow to orange and scarlet: they are very showy. The leaves are narrow, strongly ribbed, and crowded near the base of the stem. The rootstock is a very short rhizome furnished with fleshy fibres, but not truly bulbous. Propagation is effected by offsets and by seeds. Fibrous loam and peat in equal proportions with a little leaf mould and a good dash of sand, make a suitable compost. The species require cool greenhouse treatment, with a fairly liberal supply of water when making growth, but to be kept dry when resting. Repotting may be accomplished in autumn, before fresh growth commences.

Principal Species :—

Cunninghamii (*see* grandiflora). grandiflora, 2', Jy., crim. (*syns.* Backhousii, Cunninghamii, intermedia, punicea, and speciosa).
flammea, 1½', Je., dull yel. nobilis, 2', Jy., or.
— aurea, 1' to 2', sum., gold yel.

Other Species :—

intermedia (*see* grandiflora). marginata, 2', Jy., Sep., crim.

BLECHNUM.

A genus of Ferns (*ord.* Filices), closely allied to the well known and popular Lomarias. They are either of creeping or tufted habit, and often have an erect stem, like a miniature tree Fern. The handsome British Fern, popularly known as Blechnum Spicant, is correctly Lomaria Spicant. It is a grand plant, either for the greenhouse or the outdoor fernery.

Propagation.—By offsets, by division of the creeping rhizomes, and by spores.

Soil.—The species are not fastidious, as they may be grown in peat and loam in various relative proportions, with sharp silver sand or finely broken crocks intermixed to ensure porosity.

Other Cultural Points.—Some require stove moisture and heat, say, 55° to 60° in winter, and 60° to 90° in summer. Others may be grown in a greenhouse.

Principal Species :—

australe, 1½', grh. Stem stout, creeping, scaly. brasiliense, 2' to 4', grh. Nearly hdy. in various parts of Britain, but does well in st. cartilagineum, 1' to 2', grh. Leathery. longifolium, 1' to 2', st. Stem slender, creeping (*syns.* latifolium and gracile).

— fraxineum. Habit more robust.

nitidum, 1' to 1½', st.

occidentale, 1' to 2½', Aug., grh. One of the easiest to grow and accommodate (*syn.* glandulosum).

— multifidum. Crested and tasselled.

unilaterale, 6" to 1½', st. or grh. Stem elongated, fronds thin in texture (*syns.* polypodioides and triangulare).



Photo: Cassell & Co., Ltd.

BLECHNUM TRIANGULARE. BLECHNUM OCCIDENTALE.

Other Species :—

angustifolium, 1' to 1½', st. boreale (*see* Lomaria Spicant).

— aitkeniana (*see* Lomaria Spicant aitkenianum).

corcovadense (a var. of brasiliense).

denticulatum, Je., grh.

finlaysonianum, st.

fontanesianum, st.

gracile, st. (*see* longifolium).

hastatum, st.

intermedium, st.

Lanceola, 6" to 12", st.

— trifoliatum.

laevigatum, grh.

orientale, st.

pectinatum, st.

polypodioides (*see* unilaterale).

rugosum, 1', st. and grh.

serrulatum, hdy. (*syn.* striatum).

triangulare (*see* unilaterale).

trifoliatum (*see* Lanceola trifoliatum).

volubile, st., cl.

BLECHUM.

Perennial stove herbs (*ord.* Acanthaceæ). They are easily propagated by cuttings of the short side shoots taken off with a heel in spring or in summer, and put in sand under a bell-glass in a stove or pit. Fibrous loam, with a third of peat or leaf mould, will meet their requirements.

Principal Species :—

angustifolium, 1', Je., bl. *Brownei*, 2', Je., wh.
brasiliense (*see* *Stenandrium mandiocanum*). *laxiflorum*, 2', wh.

BLEEDING.

The name given to an extravasation of sap, which takes place in various plants from different causes. The Vine is the chief subject whose bleeding troubles the gardener, and fortunately this may be rectified by early pruning; at least a month being allowed to elapse between pruning and starting the Vines into growth. With Vines which have shown a previous tendency to bleed, a dressing of painter's knotting applied to the cut portion at pruning time may be recommended. Sealing with a hot iron, the application of sealing wax, or a Potato fixed on the bleeding portion, have all been tried and often found wanting. The use of all is rendered superfluous by early pruning. Gumming in the Cherry and other stone fruits is another form of bleeding.

BLEPHARIS (including *ACANTHODIUM*).

Herbs or small shrubs (*ord.* Acanthaceæ), requiring stove or greenhouse treatment. The herbs are mostly annual or biennial. Propagation can be effected in all cases by seeds. The perennial trailers and shrubby species may also be increased by cuttings under a bell-glass or in a propagating case. For compost use two-thirds of fibrous loam, one-third of leaf mould, and sufficient sharp sand to make it porous.

Principal Species :—

boerhaaviifolia, 1', Jy., (*syn.* *Acanthodium fur-*
st. ann., bl. *catum*).
capensis, 1', Jy., grh. *linearifolia*, 2', Jy., st.
bienn., bl. (*syn.* *Acan-* *ann.*, bl. (*syn.* *Acan-*
thodium capense). *thodium hirtum*).
carduifolia, 1', Aug., grh., *procumbens*, 1', Jy., grh.,
bl. *trailer* (*syn.* *Acantho-*
furcata, 2', Jy., grh., shr. *dium procumbens*).

BLEPHILIA.

Hardy perennials (*ord.* Labiatae), with flowers resembling those of the *Monardas*. They grow in rather dry soil with a little shade, and are increased by division of the roots in autumn or spring, and by seeds sown in the open or under glass at the latter season. The best species of the genus as yet introduced are *ciliata*, 2', June, purple, and *hirsuta*, 3', July, purple. Other species are *Beckii* and *brevipes*.

BLETIA.

Terrestrial and epiphytal, erect-growing Orchids (*ord.* Orchidaceæ), mostly requiring a stove temperature, but one is hardy or half-hardy. The pseudo-bulbs are leafless, or bear one or two leaves at the time of flowering. The racemes are simple or branched, and the flowers vary from white to rose, purple, and crimson. Propagation is effected by the division of the pieces or separation of the tuberous rootstock. For compost, fibrous loam and peat in equal proportions, with a dash of sand, may be used in the case of the terrestrial

species, and fibrous peat and sphagnum for the epiphytes. Repotting may be effected when new roots are being pushed out. Give plenty of water in summer when growth is active.

Principal Species :—

florida, 2', Feb., st., ro. *secunda*, 2', st., grn.,
(syn. pallida). *crim.*
gracilis, 1½', Jy., st., *Shepherdii*, 2', Jy., st.,
greenish wh. *pur.*, *yel.*
hyacinthina, 1', Ap., *verecunda*, 3', Mch., st.,
hdy. or half-hdy., ro., *pur.* (*syn.* *Limodorum*
crim. (*syn.* *Gebina*). *alatum*).
Hdy. in warm parts of
England.

Other Species :—

campanulata, st., *pur.*, *patula*, 2', Mch., st., *pur.*
wh. *reflexa*, 2', st., *pur.*, *grn.*
Gebina (*see* *hyacinthina*). *sherrattiana*, st., *pur.*,
godseffiana; probably a *wh.*, *yel.*
var. of verecunda. *Tankervillei* (*see* *Phaius*
havanensis, 2½', st., *pur.* *grandifolius*).
maculatus (*see* *Phaius* *watsoniana*, gold and
maculatus). *magenta.*
pallida (*see* *florida*). *Woodfordii* (*see* *Phaius*
Parkinsoni, 1', Jy., st., *maculatus*).
ro.

BLIGHT.

The popular name given to attacks of insect or fungus pests, such as the Potato Blight (fungoid) and the American Blight (insect). The name is commonly applied to the various aphides. *See* the various crops affected for remedies. The haze or fog often seen in hot weather is sometimes spoken of as "blight," probably because it is supposed to bring with it attacks of mildew and other fungoid diseases.

BLIND PLANTS.

Cabbages which produce no central bud, bulbs which produce no flowers, and Strawberries which bear no fruit, are generally called blind. Blindness may be caused either by a check in the early stages, while the tissues of the plant are yet tender, or by too rich feeding. Thus pot Strawberries will often go blind wholesale if given very rich soil and allowed to suffer from want of water.

BLINDS.

These are used chiefly for the protection of Orchids and other tender foliaged plants growing under glass against the rays of hot sunshine in the summer. They are also employed for letting down in front of early flowering fruit trees on walls as a guard against spring frosts. For shading purposes, blinds may be fixed temporarily or permanently, but the former is the better method, as they can be removed from the houses and stored away during the winter, when they are not required. There are several materials used for making blinds, including tiffany, frigi-domo canvas, and scrim, or gauze canvas. It should be remembered that the idea is to break the force of the sunshine, not to shut out light. All dark coloured material should be avoided, as the whiter it is the more light it will admit. The fabric known as scrim is light, durable, and one of the best materials for shading purposes. A good method of fixing blinds is to attach one end of the material to a stout lath, and the other to a round wooden roller. The lath is fastened to the

Blighia (*see* *Cupania*).

woodwork of the house at the top, and the blind is let up and down the roof from the bottom by means of pulleys and stout cords. It is advisable to provide supports above the glass level for the rollers to run on, so as to allow space for the circulation of air between the blinds and the glass. When blinds are used for the protection of wall fruit trees in the early spring, they may be hung from the coping and made to run up and down on poles placed in a slanting position, so that the material, when down, hangs clear of the trees. Where it is desirable to fix blinds at the ends and sides of glass structures, they should be suspended at the top and run up and down on light wooden rollers.

BLITUM.

Hardy annuals belonging to the Goosefoot family (*ord.* Chenopodiaceæ), sometimes grown for colouring puddings. The clusters of flowers develop into succulent, red masses, resembling a Strawberry or Bramble; hence the names of Strawberry Blite and Strawberry Spinach. Plants may be raised from seeds in any ordinary garden soil. The genus is referred to *Chenopodium* by some botanists.

Principal Species:—

capitatum, 1' to 2', My., virgatum, 2', My., Sep.,
Aug., grn. grn.
maritimum, 1' to 2', My.,
Aug., grn.

BLOOD.

Animal blood is valuable as a fertiliser, and may be applied beneficially to Vines and fruit trees. It contains about twenty per cent. of solid matter, and the remainder water. It is chiefly used in a dry state as manure, and may be mixed with soil for forming fruit borders, and for light top-dressings.

BLOOM.

The name popularly given to the coloured corolla of flowers, or to the whole inflorescence of a plant. It is also applied to the waxy excretion on the cheek of the Plum, the black Grape, or the Cucumber, whose appearance is greatly enhanced by the retention of the bloom in perfect condition. The true flowers of a plant, however, are not the popular coloured corolla, but the collection of reproductive organs which it encloses, and to effect whose fertilisation the bright appearance and nectaries attract various insects.

BLOOMERIA.

Half-hardy bulbous plants (*ord.* Liliaceæ) allied to *Brevoortia* and *Stropholirion*. They answer to the same treatment as the hardy, ornamental Alliums. There are only two species—*aurea*, 1', July, golden yellow (*syn.* *Nothoscordum aureum*); and *Clevelandii*, which is much like *aurea*, but more slender.

BLUMENBACHIA.

Erect or twining herbs (*ord.* Loasææ) covered with bristly and mostly, if not always, stinging hairs. Most of them are half-hardy annuals, but some are perennials. They are allied to *Loasa*, and

though the flowers may be pretty or interesting they are bad to handle. Propagation is by seeds in a frame, and the seedlings afterward; planted out. Any well drained, friable garden soil will suit.

Principal Species:—

insignis, 1', Jy. to Nov., half-hdy., wh., red. The stems elongate and trail upon the ground (*syn.* *Loasa palmata*).

lateritia, 20', My. to Sep., half-hdy. per., red (*syn.* *Loasa lateritia*, *L. coccinea*, and *L. aurantiaca*). Requires support, and is handsome on a low fence.

multifida, 1', Jy. to Nov., half-hdy. ann., greenish, red, and yel.; close to *insignis*.

Other Species:—

chuquitensis, Jy., Sep., coronata, 1½', Jy., Sep.,
half-hdy. cl., red, yel. half-hdy. bien. (*syn.*
contorta, 1½', Jy., Sep., *Caiophora coronata*).
half-hdy. ann., or red,
grn.

[NOTE.—For *Blumenbachia* of Koeler see *SORGHUM*.]

BOBARTIA.

Half-hardy or greenhouse herbs (*ord.* Iridææ), with a fibrous rhizome, or in one case having the rootstock thickened and resembling a corm. The leaves are slender. Flowers in one or several terminal spikes. Propagation is effected by seeds, and by division of the rhizomes or rootstock in spring. Fibrous loam, with sufficient sand to make it relatively light and porous, suits. Like many other South African members of the order, the *Bobartias* are nearly hardy, but require the protection of a cool greenhouse or frame in winter.

Principal Species:—

aphylla, 1', half-hdy., pur. (*syn.* *Marica fili-*
wh., pur. (*syn.* *Marica formis*).
aphylla). gladiata, 2', Je., half-
aurantiaca (see *Homeria* hdy., yel. (*syn.* *Marica*
aurantiaca). gladiata).
filiformis, 1', half-hdy., spathacea, 9", Je., half-
hdy., yel.

BOCCONIA. (PLUME POPPY.)

Handsome herbaceous plants or shrubs (*ord.* Papaveraceæ), the herbaceous species being very ornamental in the flower garden, and the shrubs pleasing in the greenhouse or conservatory. The herbaceous species are propagated by seeds or division in spring; and the greenhouse ones by cuttings taken off with a heel in late spring and struck in gentle heat under glass. The herbaceous *Bocconias* like a rich, heavy soil; the others need one of a rich but lighter character.

Principal Species:—

cordata, 9', Jy., buff. A handsome plant, which is very decorative at the back of the border, or in clumps on grass (*syn.* *japonica* and *Macleaya cordata yedöensis* or *jedöensis*).

microcarpa, 9', Jy., bronzy. Resembles the preceding, but is of even finer colouring.

Other Species:—

frutescens, 5', Sep., grh., integrifolia, 8', Sep., grh.,
greenish. greenish.

BCEA or BÆA.

Greenhouse perennials (*ord.* Gesneraceæ) of considerable decorative value, but very rarely met with. They are propagated by seeds sown in spring, in heat. A rich friable loam, with a third of leaf soil added, suits them.

Blister (see *Peach*).

Bloodroot (see *Sanguinaria*).

Bluebells (see *Scilla nutans*).

Blueberry (see *Vaccinium Myrtillus*).

Principal Species :—

clarkeana, 6", sum., grh.
 ferruginea, 6", sum., st.
 hygrometrica, 6", sum., grh., pale bl.

BCEBERA.

A small genus of Composites (*ord.* Compositæ), by most authorities referred to *Dysodia*, with small or medium sized heads of yellow flowers, and deeply divided leaves. Annuals increased by seeds, perennials by division. Light sandy loam and leaf mould will suit them.

Principal Species :—

chrysanthemoides, 1½', incana, 1½', Nov., grh.
 Oct., hdy. ann. (*syn.* *Dysodia pubescens*).

BCEHMERIA.

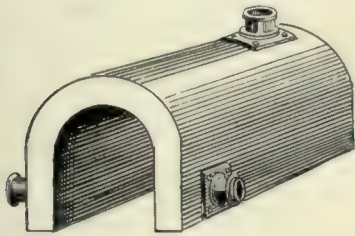
Mostly tall herbs (*ord.* Urticacæ), notable for the fibre in their stems, used for textile purposes. The most important is the China Grass or Rhea fibre plant (*nivea*). They are propagated by division, and the hardy ones are of easy cultivation in any garden soil.

Principal Species :—

cylindrica, 4', Je., Aug., hdy., grn.	ramiflora, Feb. to My., st. shr., grn.
elongata, 4', hdy., grn.	rubescens (<i>see</i> <i>Villebrunea</i> <i>rubescens</i>).
lateriflora (<i>see</i> <i>cylindrica</i>).	tenacissima (<i>see</i> <i>nivea</i> <i>candicans</i>).
nivea candicans, 6', hdy., grn.	

BOILERS.

Used for the purpose of heating glass structures, the boiler being the receptacle which holds the water and is brought into direct contact with the fire. Since the introduction of hot water for



PLAIN SADDLE BOILER.

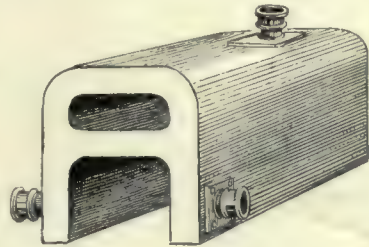
heating purposes, boilers have received careful attention at the hands of engineers, with the result that many powerful and ingenious contrivances are now in use. In all the improvements made, the main idea has been to expose as much of the surface of the boiler to the fire as possible. To effect this purpose, tubular boilers, composed of a series of tubes holding water, have come largely into use. The capacity of a boiler is dependent on the amount of surface space exposed to the fire.

Horizontal Boilers.—These apparatuses are fixed horizontally with the fire space, mostly underneath, and fed from the front. The plain saddle, having horseshoe shaped, open ends with a fire cavity underneath, is the simplest form of horizontal boiler; but it has undergone many improvements, in the way of waterway ends, return flues through the crown, and water tubes substituted for the plain sides and crown. Saddle

boilers of different sizes are suitable for heating both small and large structures. A powerful horizontal boiler is the Cornish Trentham, which is like a large cylinder, with the fire in the centre of the boiler. It is excellent for heating long ranges.

Upright Boilers.—These are mostly made on the tubular principle, and are fixed perpendicularly. Powerful appliances of this kind are used for the heating of long ranges of piping, and are generally fed from the top by means of a funnel.

Independent Boilers.—Not the least important among boilers are the appliances made for heating



SADDLE BOILER WITH WATERWAY ENDS.

the small greenhouses and conservatories of amateur gardeners, and in the making of these a large amount of ingenuity is displayed. Of these apparatuses there is a great number on the market, made on different plans but with the same objects in view. They are fixed in position without the need of stoke-holes or brickwork, and may be readily removed. They are so arranged as to burn and maintain heat for a long time without much attention, while they effect the purpose of warming a small house adequately, without the danger of the water boiling and turning into steam. To meet the requirements of the amateur still further, heating apparatuses on the boiler principle are made, for the working of which oil and gas are used as fuel, and they are suitable for warming very small structures. Though the simplest of boilers do their work satisfactorily if properly fixed, the improvements on the types are quicker in action, and generally more economical in the way of fuel. (*See also* HEATING.)

BOLETUS.

A genus of some forty-one British species of fungi (*ord.* Fungi), with the habit of an *Agaricus* or Mushroom, but differing remarkably in the form of the hymenium or spore-bearing surface. This consists of numerous slender tubes, open at the round or angular mouth, and closely packed, but readily separable from one another. The spores are produced on the inner face of these tubes. The species grow upon the ground, and are mostly edible, but a few poisonous. The latter may readily be distinguished by the red mouth of the tubes. Although experts eat the greater number of the species, only a very few are in any way popular. Some of the most highly appreciated are *edulis*, *luteus*, *fragrans*, *impolitus*, *æstivalis*, and *scaber*.

Bojbean (*see* *Mengyanthes trifoliata*).

Boldea (*see* *Peumus*).

BOLEUM.

A pleasing shrub (*ord.* Cruciferae) for the rock garden. It is of evergreen habit. The only species is *asperum*, which grows nearly 1' high, and has cream-coloured flowers. It is propagated from seeds sown under glass in spring, or from cuttings struck under a frame or handlight in summer. It can be grown in a light soil, but should not be planted where cold winds will strike upon it.

BOLTING.

The term used in connection with the premature running to seed of certain vegetables, chiefly of the Brassica tribe. This condition is generally



BOMAREA OLIGANTHA

brought about by a shallow root run, hot dry soil, abnormally high temperatures, or unseasonable sowing of seeds. Bolted Lettuces may be economically disposed of by cooking and serving as Spinach, for which they form a very good substitute.

BOLTONIA.

Handsome border flowers (*ord.* Compositae), and valued for cutting. Hardy herbaceous perennials. Propagation is by division in spring or autumn, or by seeds sown in the open or in a frame in spring. Any good soil, such as is suitable for other border flowers, will do. *Asteroides* and its variety *decurrens* like a moist, and the others a dry, soil.

Principal Species :—

asteroides, 4' or more, Jy., wh. or pk. A fine plant with pleasing coloured foliage.

— *decurrens*, 4' or more, Jy., pale vio. The largest flowered and most ornamental of the genus.

Bolivaria, (see *Menodora*).

Bollea (see *Zygopetalum*).

Other Species :—

diffusa, 4', Aug., wh.

latisquama, 3' to 5', Aug., bl. vio.

BOMAREA.

A genus of plants allied to *Alströmeria* (*ord.* Amaryllideae), differing from the latter chiefly by their twining habit. The long, twining stems are furnished with smooth, slightly fleshy leaves. Propagation is effected by seeds, offsets, and division of the fleshy, fibrous rootstock. They delight in a light and dry soil, such as sandy loam, or sandy loam and peat, well drained; but are otherwise not fastidious. Most of them may be grown very cool, even in a cold frame during winter, but they thrive better and flower more freely in a dry, moderately warm greenhouse.

Principal Species :—

acutifolia, 6', Aug., Oct., grh., red, yel., grn. (*syn.* *Alströmeria acutifolia*).

— *aurea*, 6', Aug., Oct., grh., red, yel., grn.

— *chrehnbergiana*, 6', Aug., Oct., red, yel.

— *maculata*, 6', Aug., Oct., red, grn.

Carderi, 8', grh., ro. spotted. A noble plant with umbels 1' to 2' across (*syn.* *Shuttleworthii*).

edulis, 6', Je., Jy., grh.,

grn., crim., tubers eaten (*syn.* *Alströmeria oculata*).

oligantha, 8', grh., red, yel.

patacoensis, 8', grh., car., ro. Umbels large.

Flowers 2" long.

Salsilla, 5', My., Jy., grh., red pur. (*syn.* *Alströmeria oculata*, of *Bot. Mag.*, 3341).

Shuttleworthii (see *Carderi*).

Williamsiae, 6', st., ro. spot pur.

Other Species :—

conferta (see *patacoensis*).

frondea, 8', grh., light yel. spot.

Kalbreyeri, 8', grh., or.

rosea, 3', Je., hdy., red grn., yel.

sororia, 6', grh., ro. spot car.

vitellina, 6', grh., of. yel.

BOMBAX.

Mostly tall trees (*ord.* Malvaceae), requiring stove heat. Leaves ornamental. The flowers are solitary or in clusters, small, and white or red. Propagation is accomplished by cuttings getting firm at the base, inserted in sand, and placed in a propagating case. Good, fibrous loam and a dash of sand will meet their requirements in the matter of soil. They should have a moist atmosphere in a tall stove or warm conservatory if required to show anything of their natural development.

Principal Species :—

Ceiba, 100', pale red (*syn.* *quinatum*).

malabaricum, 60', sc. (*syn.* *heptaphyllum*).

septenatum, 50', wh.

Other Species :—

globosum, 60', st.

heptaphyllum (see *malabaricum*).

quinatum (see *Ceiba*).

BONATEA.

A genus of two or three erect, stout stemmed, terrestrial Orchids (*ord.* Orchidaceae). They are allied to *Habenaria*, and have leafy stems, undivided root tubers, and large, showy flowers. Propagation is effected by division of the tubers. Loam and peat in equal proportions, with sand, make a suitable compost. They should be grown

Bombix neustria (Lackey Moth, see *Apple Enemies*).

in a cool pit, greenhouse, or Heath house, and treated similarly to Disas.

Principal Species :—

speciosa, 2', Aug., grn., wh.

BONES.

In various forms and various sizes, bones form one of the most valuable fertilisers the gardener can command. Their fertilising properties are chiefly due to phosphate of lime entering largely into their composition, much in the same way as it does into vegetable tissue generally. Bones reduced to the fine powder called bonemeal are readily assimilated by the roots of plants, and influence to a marked extent the resulting growth. Sown in the trenches with Peas of either the sweet or culinary type the material is invaluable; while for grass lawns a dressing of 4 or 5 ounces per square yard repays the initial cost many times over in the increased wealth of green herbage produced. Half or quarter inch bones are frequently mixed with the soil of Vine or other fruit borders, and, being less soluble than bonemeal, provide the occupants with a reserve of food to draw on as occasion demands. What was almost an epidemic among Chrysanthemums, resulted from putting bones over the crocks a few years ago; they became putrid. Superphosphate of lime, which is a well-known fertiliser for all garden and field crops, may be prepared by mixing sixteen parts of bonemeal, twelve parts of Oil of Vitriol, and twelve parts of water, all by weight, and leaving for at least a day and night before using; but it is more economical to buy the fertiliser.

BONGARDIA.

Rauwolfia is the only species of this genus in gardens. It is a pretty tuberous perennial (*ord.* Berberidæ), but suffers much from continued wet in winter, and is thus not quite hardy, unless covered with glass or a slate at that season. It grows about 6" high, has yellow flowers, requires a sandy soil, and is propagated by division or seeds (*syn.* *Leontice altaica*).

BONNAYA.

Annual, biennial, or perennial herbs, closely allied to *Torenia* (*ord.* Scrophularinæ), and requiring stove culture. The annuals and biennials are increased by seeds, the perennials by cuttings. For soil, use good loam, leaf mould, and sand, in pots and baskets.

Principal Species :—

<i>brachycarpa</i> , Je., st.	<i>veronicaefolia</i> , 6", Aug.,
ann., vio.	st. bien., pk.
reptans, 6", Jy., st. per.,	
bl.	

BONNETIA.

Stove trees (*ord.* Ternstroemiaceæ), with evergreen foliage and flowers in clusters towards the top of the branches, or in terminal panicles. Propagation may be accomplished by cuttings of matured shoots in sand in a propagating case. Loam, peat, and sand make a suitable compost.

Principal Species :—

sessilis, 15', st., pur.

BONPLANDIA.

A genus of one species, a small sub-shrub (*ord.* Polemoniaceæ). The species (*geminiflora*) has been

Bonapartea of Ruiz and Pavon (*see Tillandsia*).

badly treated. It has been described as *Galipea* and *Caldasia heterophylla*. It has violet flowers, but is very rarely seen in cultivation. Propagation by seeds and cuttings. Soil, loam and leaf soil in equal parts, with sand.

BORAGE.

The leaves of this annual plant (*Borago officinalis*, *ord.* Boraginæ) are used in salads or in the same way as Spinach when young. The flowers and leaves are employed for giving an aromatic flavour to liquors. Seeds should be sown at intervals to keep up the supply. March, July, and September are all suitable seasons for the respective crops, varied a little for early or late districts. The seeds ought to be sown on a warm, well-drained border in drills about 1' apart. Thin out the young plants to 10" or 12" apart.

BORAGO (*syn.* BORRAGO).

Hardy perennial or annual plants (*ord.* Boraginæ), not much grown, with the exception of *officinalis*, which is a good bee plant. The species are propagated by seeds or division, and thrive in common soil, but do best on that which is dry and rather stony. The most useful is *officinalis*, 3', August, blue, an annual. Others are *laxiflora*, 1', July, blue, hardy perennial; and *longifolia*, 1', July, blue, an annual.

BORASSUS (*syn.* LONTANUS).

A tropical genus (*ord.* Palmæ) of tall, handsome Palms with huge leaves. They are not much grown in this country, as they need large houses. They require a stove temperature, and may be propagated by seeds in brisk bottom heat. The soil should consist of three parts of loam, one part of well rotted cow manure, and sand. The flowers are of one sex only, and the male and female flowers are borne upon different plants (dioecious). The only species is *flabellifer*, 30', which has enormous, nearly circular, leaves, with a great number of stout midribs. It is very rarely seen in cultivation, and is remarkable for its curiously bulging stem (*syn.* *flabelliformis* and *æthiopicum*).

BORBONIA.

Ornamental greenhouse evergreen Cape shrubs (*ord.* Leguminosæ), with yellow flowers, usually appearing in July. Tips of the half-ripened shoots root easily if taken in spring, and placed under a bell-glass in a cool shaded house. Peat and loam in equal parts, with sand, form a suitable compost. Free drainage is essential, and, like other free-flowering hard-wooded subjects, the plants require plenty of water in summer. Firm potting is advisable.

Principal Species :—

<i>barbata</i> , 3' to 4', Jy.	<i>crenata</i> , 3' to 6', Jy.
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Other Species :—

<i>cordata</i> , 3' to 6', Jy.	<i>ruseifolia</i> , 2' to 4', Jy.
<i>lanceolata</i> , 2' to 3', Jy.	<i>undulata</i> , 4', Jy., yel.

BORDEAUX MIXTURE.

A valuable fungicide, first used in the Vine-growing districts of Bordeaux as a destroyer of mildew. It is largely used for the spraying of Potatoes, to prevent and check disease. It is excellent for other fungoid diseases, such as leaf curl in Peaches, rust on Chrysanthemums, Tomato diseases, mildew, and orange rust on Roses.

Preparation.—One lb. sulphate of copper (blue-stone); dissolved in a little hot water. One lb. quicklime; dissolved in cold water. Pour together when cool and add 10 gallons of water. If 1 lb. of common treacle is dissolved with the lime as it slacks in the water, the mixture adheres better. Stir thoroughly and apply with a spraying apparatus, or a syringe with a spraying nozzle attached. By this means a misty spray is obtained, and a thin, greenish blue sediment is deposited on the foliage. Bordeaux Mixture will keep for some time if covered, to prevent air having free access to the surface. It should be mixed and kept in a wooden vessel. Being poisonous to some extent, it should not be applied to edible fruits within a few weeks of the time of gathering.

BORDERS.

The term "border" is applied to a portion of land used for growing fruit, flowers, or vegetables, and whose total length considerably exceeds its width. The name is also sometimes given to a row of plants used as an edging.

Fruit borders are generally formed beneath high walls, on which the fruit trees are trained, the ground at their base being often planted with vegetables. Controversy has raged fiercely as to the merits and demerits of sub-cropping fruit borders in this manner, but the general consensus of opinion seems to be that, provided the secondary crop is quick growing and shallow rooting, no harm is done, but on the contrary the fruit trees benefit by the frequent applications of manure which are dug into the border for the assistance of the interlopers. The practice may easily do harm, however. The fruit border should be thoroughly drained, and have plenty of $\frac{1}{4}$ " or $\frac{1}{2}$ " bones incorporated with the soil, besides which, occasional top-dressings of some of the well-known fruit fertilisers should be given annually. A path 1' wide, which may be made of ashes, should run parallel with the wall at about 18" from it, which will give ready access to the trees for pruning, nailing, or gathering the fruit.

Vine borders are of three descriptions, viz., inside, inside and out, and outside. Controversy has here again been busy as to the relative merits of these, some enthusiasts holding strongly by the inside border, while other ardent viticulturists declare in favour of outside ones. (See VINES.)

Herbaceous borders are invaluable in a large garden, and may be so planted as to furnish supplies of flowers almost the whole year round. Many of their occupants are very strong growers, and become rank and weedy unless taken up, divided, and replanted every three years. Weakly plants may often be restored to health by removing the flowers before these open for one season. This will relieve the plant of a great strain and allow it an opportunity of recuperating. (See ALPINES, HERBACEOUS, etc.)

Ribbon borders are so called when their occupants run in lines or ribbons; a practice often followed with summer bedding plants. (See BEDDING OUT.)

BORECOLE or KALE.

Description.—Useful green vegetables (Brassica oleracea fimbriata, *ord.* Cruciferae), yielding edible leaves and tender shoots liberally during the winter and spring. They are extremely hardy, and frequently survive when other Winter Greens are cut down by severe frost. Some of the

varieties produce coloured leaves, and are decidedly ornamental.

Propagation.—From seeds sown in beds of light soil outdoors at the end of March and early in April. Prick out the seedlings, and transplant in June and July; 2' apart, in rows 2½' asunder.

Soil.—A very rich soil is not advised, or the plants are apt to make rank growth, which frequently suffers in the winter. If the soil is firm and holding it will be better for the plants.

Other Cultural Points.—If put out in showery weather, or well watered in, growth will be strong



Photo: Cassell & Co., Ltd.

BORECOLE STORRIES' ALBINO.

and sturdy. Borecole may be planted as late as any of the Winter Greens, and follow a previous crop, like early Peas. Plants may also be grown between rows of second early Potatoes, planted 2½' apart. The Greens are useful till flowering commences in the spring.

Enemies.—Slugs, small birds, and flea beetle (*Haltica nemorum*) play havoc with young seedlings as soon as they appear above the ground, and prompt preventive measures must be taken. Dustings of lime, soot, and fine road dust, when the seedlings are damp with dew, are good checks on slugs and "flea." Birds, which take seeds before they germinate as well as after, should be prevented by placing wire hoops in the ground, and stretching garden netting over the beds.

Club root (see CABBAGE ENEMIES).

Caterpillar (see CABBAGE CATERPILLAR).

Gall Weevil (see CABBAGE ENEMIES).

Varieties:—

Asparagus Kale, useful in the spring.

Dwarf Curled Scotch, compact, hardy.

Improved Hearting, centre leaves incurved.

Storries' Albino (see figure).

Variegated or Garnishing, coloured foliage, varying wh., grn., pk., and crim.

BORONIA.

Description.—Dwarf and elegant shrubs (*ord.* Rutaceæ), usually with very thin and wiry branches, and fine, fibrous roots. Most of them need a greenhouse temperature. Of the species named below—heterophylla, elatior, and megastigma are very popular plants. All are fragrant to some extent, but megastigma is especially noticeable for its powerful perfume. From a decorative point of view heterophylla is the most valuable.

Propagation.—By cuttings, about 2" in length of tips of the side shoots, inserted in summer in very sandy soil, in a cold frame, and covered with a bell-glass. No artificial heat is needed, but the bell-glasses must be frequently lifted off and the moisture wiped from them, otherwise the cuttings will damp.

Soil.—Peat and loam in equal proportions, with one-sixth of silver sand, and a little crushed charcoal.

Other Cultural Points.—Like all New Holland plants, Boronias are very impatient of drought. Lack of water they should never be allowed to feel. Nor must they be kept very wet, and thus plenty of drainage, and rather small pots, are advisable. The young cuttings should not be given large shifts, a 6" pot being quite sufficient for a good specimen. During the growing season, pinching must be practised several times to induce a bushy habit. The plants benefit considerably by a sojourn in the open air from the end of July until the beginning of September, or until frosts threaten. Afterwards they should be given a light and cool, but not draughty, position in the greenhouse. The only stimulants to be recommended are weak soot water and liquid cow manure.

Principal Species :—

elatior, 4', My., ro. car., fragrant.	maroon, yel., very fragrant.
heterophylla, 3', My., ro.	serrulata, 1' to 6', Je., ro.,
megastigma, 1½', spr.,	fragrant, bushy.

Other Species :—

alata, 2' to 6', My., ro.	pinnata, 2', Feb., My., pk.
crenulata, 2', Jy., red.	polygalifolia, 1' to 3', Mch., Jy., red.
denticulata, 2' to 6', Mch. to Aug., ro.	pulchella, 1' to 3½', My., pur. (<i>syn.</i> tetrandra).
— alba, wh.	triphylla (<i>see</i> ledifolia).
Fraseri, 2', My., pk. (<i>syn.</i> anemonifolia).	viminea, pk.
ledifolia, 1½', Mch., red.	

BORRERIA.

Stove sub-shrubs or herbs (*ord.* Rubiaceæ), sometimes placed under Spermacoce. The perennials may be increased by cuttings placed in heat, and the annuals by seeds sown, also in heat, in spring. Equal parts of loam and leaf soil, with sand, suit the plants.

Principal Species :—

stricta, very close to verticillata.
verticillata, 2', Jy., wh.

BOSCIA.

An obscure genus of stove plants (*ord.* Cappari-deæ), propagated by cuttings of the ripened shoots in spring in brisk bottom heat, and requiring equal parts of fibrous loam and peat, with free drainage. Senegalensis, 3', summer, white, is

an evergreen shrub, with flowers in which the petals are lacking.

BOSSIÆA.

Australian shrubs (*ord.* Leguminosæ) requiring a greenhouse temperature in this country. They are rarely met with under cultivation, although several of them are elegant subjects. Propagation is by cuttings of tips of the half-ripened shoots taken in spring, and placed under a bell-glass in a cool house, or by seeds sown in spring on a gentle hotbed. Equal parts of sand and peat suit the cuttings; and equal parts of fibrous loam, peat, leaf mould, and sand the established plants. Like all hard-wooded plants, the fine roots resent drought, and the plants should never be allowed to be dry. Fairly firm potting is advisable.

Principal Species :—

cinerea, 1' to 3', My., yel. (<i>syn.</i> cordifolia and tenuicaulis).	linophylla, 1' to 4', Jy. to Aug., or, pur.
disticha, 1½' to 2', Mch. to My., yel., red.	ornata, 1' to 2', Ap. (<i>syn.</i> Lalage ornata).
	rhombifolia, 1' to 3', Ap., yel. (<i>syn.</i> lenticularis).

Other Species :—

ensata (<i>see</i> riparia).	prostrata, 6'', Aug., yel.
eriocarpa, 1', My., yel.	riparia, 1' to 2', Ap., yel.
heterophylla, 1' to 2', Sep. (<i>syn.</i> B. lanceolata, Platylobium lanceola- tum, and P. ovatum).	rufa, 6', Aug., pur. (<i>syn.</i> ensata).
microphylla, 1' to 2', spiny.	— foliosa, 1' to 3', My., Je., yel., or. (<i>syn.</i> foliosa).
linnæoides (<i>see</i> prostrata).	scolopendria, Plank Plant, 3' to 10', My., yel., br. red.

BOSWELLIA. (OLIBANUM TREE.)

Stove evergreen trees (*ord.* Burseraceæ), chiefly noteworthy for their economic properties. They may be increased readily by cuttings dibbled in sand and placed in a warm propagating frame, and thrive subsequently in loam and peat in equal proportions, with a little sand.

Principal Species :—

glabra (<i>see</i> serrata).	serrata, 20', sum., wh., yel.
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BOTHY.

A residence provided in private establishments for the accommodation of under gardeners. A bothy usually consists of sleeping and living rooms. The accommodation provided for young gardeners has improved considerably of late years.

BOTRYCERAS.

An obscure genus (*ord.* Anacardiaceæ) of diocious plants with flowers. Synonyms of it are Daphnitis, Laurophyllus, and Laurophyllus. The plants do well in a greenhouse in a mixture of peat, loam, and sand, and may be increased by cuttings under a hand-light.

Only Species :—

laurinum, 4', Je., wh., grn.

BOTRYCHUM. (MOONWORT.)

A genus (*ord.* Filices) of so-called "flowering" Ferns. All are hardy, with the exception of daucifolium, and easy to grow. They are increased by spores. A mixture of sandy loam and leaf soil suits them well, and they like partial shade. A position in a sheltered nook in the rockery is very much to their liking.

Principal Species :—

Lunaria, The Common Moonwort, fertile fronds, 4" to 5"; sterile fronds, 2" to 3".
ternatum, fertile fronds, 6" to 12"; sterile fronds, 4" to 12". There are several varieties; see second list.

virginianum, fertile and sterile fronds, 6" to 18". This species requires a little protection in win. in very bleak situations. Lanuginosum is a very woolly var.

Other Species :—

australe, a geographical var. of ternatum.	obliquum, a var. of ternatum.
daucifolium, 9" to 18", grh. (<i>syn.</i> subcarnosum).	subcarnosum (<i>see</i> daucifolium).
lunarioides, a var. of ternatum.	

BOTTOM HEAT.

Now generally supplied to plants by hot-water pipes, but the old-fashioned manure pit or hotbed with its warm, moist, growing atmosphere is still a power to be reckoned with. (*See* Hotbeds and Heating.) Bottom heat is applied to start plants or seeds into growth, and to cause cuttings to emit roots; and should, as a general rule, be about 5° higher than the temperature of the surrounding atmosphere.

BOUCEROSIA.

Succulent greenhouse perennials (*ord.* Asclepiadæ), closely allied to Stapelia, and needing similar cultural attention. The plants flower freely, and the flowers are very fleshy, strongly reflexed, and of a curious appearance, with strong markings. The stems and branches are four-sided, and the acute angles with which they are furnished are more or less spiny.

Principal Species :—

europæa, 4", sum., pur., br., yel. (*syns.* Apteranthes gussoniana and Stapelia gussoniana).
maroccana, 4", sum., red pur. with yel. concentric markings.

BOUCHEA.

Stove and greenhouse herbs and sub-shrubs (*ord.* Verbenacæ), very rarely met with in cultivation, and of no great value. They may be increased by cuttings under glass in spring in a gentle heat, and need a compost of loam and peat.

Principal Species :—

cuneifolia, 4', Ap., wh., grh. shr. (*syn.* Chascanum cuneifolium).
pseudo-gervão, 2' to 5', Sep., pur. wh. throat, st.

BOUGAINVILLEA.

Description.—Showy shrubby climbers (*ord.* Nyctaginæ), requiring a warm greenhouse or stove temperature. The flowers are small and green, but the bracts are large and showy, and are commonly regarded as the real flowers. The plants are of very easy culture, and once they attain maturity flower regularly and well each year.

Propagation.—By cuttings of tips of the half ripened wood inserted in very sandy soil in brisk bottom heat in a close frame.

Soil.—The bulk should be of good loam, with a sixth part each of leaf soil and rough grit or sand.

Other Cultural Points.—Bougainvilleas may be

Botryodendrum (*see* *Meryta*).
Bottle Gourd (*see* *Lagenaria*).

grown either in pots or planted out in specially prepared borders. Pot culture is not to be recommended, however, for the tied-in shoots are stiff and formal, although they may flower well. The border may have a total depth of 2', of which 6" should be drainage. The main branches should be trained to the roof, and the smaller shoots allowed to hang down with their burden of flowers. There is a close similarity between the treatment required by Bougainvilleas and that given to Vines, viz. plenty of water during the growing season, less in the autumn, and very little, if any, in the winter. The pruning consists in closely spurring back each autumn the shoots made during the previous summer. Like Vines, also, a little disbudding is needed in spring when the young growths begin to push. Frequent syringing will help the swelling buds considerably. Liquid manure may be given in the growing season, but the roots must not be excited by stimulants during the resting period.

The most troublesome insect pests are mealy bug and thrips, but they may be kept under by the remedies which will be advised under their names.

Principal Species :—

glabra, sum., bright ro.	larger than those of
— Coker Court var.	glabra.
— sanderiana, sum., ro.,	— superba, sum., rich
very free, good for sub-	ro., very large, the
tropical bedding,	finest of all.
speciosa (<i>see</i> spectabilis).	— variegata.
spectabilis, lil. ro., bracts	

Other Species :—

refulgens, sum., st., pur., mauve.

BOUSSINGAULTIA.

Half-hardy plants (*ord.* Chenopodiaceæ) with tuberous roots, pretty, but little known. They may be propagated by the tubercles, which are borne in numbers upon the stems. They like a light, rich soil, and a well-drained position, where they can get plenty of sun. This especially applies to baselloides.

Principal Species :—

baselloides, 2' to 8', aut., wh. passing to blk., fragrant. An elegant little trailing plant, doing best in a grh.

cordata, very close to baselloides.

Lachaumei, st., ro.

BOUVARDIA.

Description.—Evergreen shrubs (*ord.* Rubiaceæ) requiring the temperature of a warm greenhouse. The flowers are very freely produced, and of bright and varied hues. Bouvardias are commonly grown as winter flowering plants, and they are among the most useful and easily grown subjects available for the purpose. They may also be utilised as summer bedders, flowering profusely towards the end of the summer. Few of the species, with the exception of Humboldtii corymbiflora and triphylla, are to be met with in cultivation, but there are many beautiful hybrids, for which *see* special list.

Propagation.—By cuttings of the young shoots taken off in spring with a heel of the old wood. After the plants have finished flowering they should be cut hard back, placed in heat, and frequently syringed. They will then break freely into growth, and furnish plenty of cuttings, which are best taken off when they are about 2" long. A gentle bottom heat, and an atmospheric temperature of 60°, will ensure quick rooting. Also by root cuttings.

Divisions having two or three good eyes quickly root if placed in conditions similar to the top-cuttings.

Soil.—Two parts of loam, two parts of leaf soil, and one part of decomposed cow manure, with plenty of sand.

Other Cultural Points.—As soon as the cuttings are rooted they should be grown steadily on in gentle heat. Several shifts will be required, but in no case should a big shift be given. Pinching must be resorted to in order to induce a bushy growth. Syringing is beneficial in the earlier stages, but unnecessary in the later. Old plants may be shaken out of the soil, after the pruning, and grown on for an indefinite number of years if desired. Or they may be planted out in prepared borders and lifted and potted in the autumn. After flowering is complete the plants should be partially dried off, to ripen the wood prior to the annual pruning.

The chief insect pests which attack the cuttings are thrips and red spider, and light fumigations must be given. Mealy bug and green fly attack the older plants, in addition to the two first named pests. Dusting with tobacco powder is a deterrent to the fly.

Principal Species :—

angustifolia, 2', Sep., pale red.	jasminiflora, 2', win., wh., sweet.
flava, 1½', Mch., yel.	leiantha, 2', Jy., Nov., sc. longiflora (see <i>Houstonia longiflora</i>).
Humboldtii corymbiform, 3', aut., win., wh., large and sweet.	triphylla, 2' to 3', sc. (syn. <i>Jacquini</i>).

Other Species :—

Cavanillesii, 1½', My., red (syn. <i>multiflora</i>).	multiflora (see <i>Cavanillesii</i>).
hirtella, pk. or red.	versicolor, 2' to 3', Jy., Sep., sc., yel.
Jacquini (see <i>triphylla</i>).	

Garden Hybrids—a Selection :—

*Alfred Neuner, double wh. or flesh pk.	longiflora flammea, blush ro.
Brilliant, crim.	*Maiden's Blush, blush ro.
*Dazzler, sc.	*President Garfield, double pk.
*Hogarth, sc.	Purity, wh.
Hogarth flore pleno, sc.	*Vrielandii, wh.

* Select for six varieties.

BOWENIA.

Curious greenhouse plants (*ord.* Cycadaceæ) with a Fern-like appearance. They are closely allied to *Zamia*, and answer to the same treatment as that accorded to *Cycas*. *Spectabilis* has a short, stout, cylindrical trunk, and the leaflets (pinnæ) are very thick and leathery.

BOWIEA (OF HAWORTH).

A rather curious genus of plants (*ord.* Liliaceæ), with twining stems and a bulbous rootstock. They are really greenhouse subjects, but will do out of doors, except in severe weather. They may be increased by seeds or offsets, and like a light, well-drained, rich soil. They do best when planted in a specially prepared border. *Volubilis* has thick and fleshy, but narrow, leaf-like twigs, and is a graceful-looking plant. Now included under *Aloe*.

BOX EDGING.

Dwarf plants of Box (*Buxus sempervirens suffruticosa*) are suitable for forming edging for walks and flower beds; but they have some drawbacks, as they exhaust the soil, and are excellent hiding places

for slugs. Small rooted pieces may be planted in the autumn or early spring against the perpendicular side of a narrow trench, taken out along the edge of the walk or bed where the Box is to grow. Box edges are frequently spoiled by neglect in clipping, and this operation should be performed in June. When the edges get sparse they should be lifted, and the roots divided. Work in a little fresh soil before replanting.

BRABEIIUM. (AFRICAN ALMOND.)

Greenhouse evergreens (*ord.* Proteaceæ), thriving under the same conditions as *Banksias*. *Stellatifolium*, 15', August, has white, fragrant flowers. It is a native of the Cape, where the Natural Order Proteaceæ finds its headquarters.

BRACHYCOME. (SWAN RIVER DAISY.)

Charming little half-hardy annuals or perennials (*ord.* Compositæ) which delight in a sandy soil and a sunny situation, and are very suitable for small beds or for edgings or groups in the border. They can be sown under glass in March and transplanted, or in the open in April or May where they are to bloom. The best-known species is *iberidifolia*, which grows about 1' high, and has single, Daisy-like, blue or white flowers. There is also a perennial species for the greenhouse, named *diversifolia*. It bears white flowers in May, and is evergreen; it is propagated by cuttings or seeds.

BRACHYGLOTTIS.

Half-hardy trees or dwarf shrubs (*ord.* Compositæ). Propagation is by seeds and cuttings in spring. Soil, peat and loam in equal parts, with sand, and plenty of drainage. *Repanda*, the only species, was introduced a few years ago from New Zealand. It promises to be a good seaside tree for the south coast.

BRACHYLÆNA.

Evergreen greenhouse shrubs (*ord.* Compositæ) closely related to *Baccharis*. Natives of South Africa. Propagated by cuttings of the half-matured shoots in sandy soil, in a close frame. A mixture of peat and loam, with sand, is a suitable compost for the older plants.

Principal Species :—

dentata, sum., yel., foliage rusty when young.	neriefolia, 2', Aug., Nov., yel.
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BRACHYOTUM.

Evergreen bushy shrubs (*ord.* Melastomaceæ), propagated by cuttings in heat under a bell-glass, and succeeding in peat and loam in a stove. *Confertum*, November, purple, is the only species introduced.

BRACHYPTERYS.

A little known genus (*ord.* Malpighiaceæ) of climbing shrubs. They require a stove temperature, and do well in loam, leaf mould, peat, and sand.

Principal Species :—

borealis, 6', Jy., yel.

BRACHYSEMA.

Evergreen shrubs (*ord.* Leguminosæ) of climbing or sub-climbing habit. *Latifolium* is the best of the genus, and when well treated it makes an elegant roof climber. The plants may be increased by cuttings of the half-matured shoots in summer,

Brachychiton (see *Sterculia*).

Boxer (see *Arbours*).

and these strike readily if inserted in sandy soil and placed in a propagating frame with bottom heat. Seeds germinate fairly well if sown in bottom heat in March. Peat, leaf soil, and loam in equal parts, with a sixth of the bulk sand, make an excellent compost. The most important point is the drainage, which, both for pot specimens and for those planted out, must be ample.

Principal Species :—

latifolium, Ap., crim., sc., cl. *undulatum*, Mch., vio., sub-cl. (*syn.* *melanopetalum*).

They are propagated by seeds when obtainable. They like plenty of heat and abundant moisture, both at the root and in the atmosphere. Soil, two-thirds loam and one-third decomposed cow manure, with one-sixth coarse sand.

Principal Species :—

dulcis, grh., petioles filamentosa (*see* *Washingtonia filifera*). woolly.

BRAINEA.

Handsome Tree Fern (*ord.* Filices) requiring a stove temperature. Propagated by spores. Soil,



BRASSAVOLA (LÆLIA) DIGBYANA.

Other Species :—

lanceolatum, 3', sc., yel., wh. *melanopetalum* (*see* *undulatum*).

BRACHYSTELMA.

Curious and uncommon greenhouse perennials (*ord.* Asclepiadæ), with twining stems. They may be increased by cuttings in brisk bottom heat, and by root division. They like equal parts of loam, peat, and leaf soil, with sand.

Principal Species :—

Arnottii, 4', br. grn. *ovatum*, 1', yel. grn.
Barberiae, 6'', Aug., dull pur. *spathulatum*, 1', Je., grn.
crispum, 6'', br. yel. *tuberosum*, 1½', Je., pur.

BRAHEA.

Dwarf Palms (*ord.* Palmæ) with fan-shaped leaves, and small, green, hermaphrodite flowers.

Brachyspatha (*see* *Amorphophallus*).

Bract and Bracteole (*see* *Glossary*).

Brake Fern (*see* *Pteris aquilina*).

equal parts of fibrous peat and loam, with sand, and a few pieces of charcoal. *Insignis*, the only species, has fronds 2' to 3' long and 1' broad. An easy plant to grow.

BRAMBLE (*see* BLACKBERRY).

BRASENIA.

A small genus (*ord.* Nymphæacæ) rarely grown in this country. It requires the protection of a frame or greenhouse, and must be planted in a tank of water. It may be propagated from offsets, and should be grown in a loamy soil.

Only Species :—

Schreberi, 3'', Jy., red (*syn.* *Hydropeltis purpurea*).

BRASSAVOLA.

Description.—The *Brassavolas* (*ord.* Orchidacæ) are interesting, but not very showy, Orchids, and since the botanists have transferred what were so long known as *B. digbyana* (*see* figure) and *B. glauca* to the genus *Lælia* they have become even less

popular with cultivators. The several species come from tropical America, and have slightly thickened stems, each bearing one or two stiff, thick leaves. The flowers are terminal, of moderate size, and mostly of a green or whitish colour.

Culture.—Given a stove temperature, plenty of water during the season of active growth, and only a very occasional watering when at rest, the *Brassavolas* are not particular whether grown in pots or baskets, or on rafts. If the former are used ample drainage must be afforded; use peat with a little sphagnum moss for compost.

Principal Species :—

<i> cucullata</i> , 6", Je., pur., wh.	<i> lineata</i> , 1', Feb. to Ap., crim., wh.
<i> grandiflora</i> , 1½', Mch., wh.	<i> tuberculata</i> , 9", Jy., wh. (<i>syn. gibbsiana</i>).

Other Species :—

<i> cordata</i> , 1', My., wh., grn.	<i> elegans</i> (now <i>Tetramicra rigida</i>).
<i> cuspidata</i> , 6", Mch., wh.	<i> martiana</i> , 1', Mch., wh.
	<i> Perrinii</i> , 1', Sep., grn.

BRASSIA.

Description.—These Orchids (*ord. Orchidaceæ*) form a genus of some twenty species, natives of tropical America. Some species have bright-hued flowers, but others are sombre coloured; all have blooms with long, narrow segments, and consequently a somewhat spidery appearance. When well grown, the long, arching spikes, with their two rows of flowers, are strikingly graceful, and admirable for association with other flowers or plants. *Verrucosa* is very free flowering.

Culture.—*Brassias* are readily managed if grown as, and with, many of the *Oncidiums*, giving them a light position at the warmer end of the intermediate house. Deep pans suit the various species, provided the drainage is ample; fibrous peat and sphagnum moss suffice for compost, but a few small crocks should be added as potting proceeds. When at rest, *Brassias* resent overwatering, but when in full growth, or flowering, a fairly large water supply is necessary.

Principal Species :—

<i> antherotes</i> , 1½', My., Je., yel., pur., br.	<i> lawrenceana</i> , 1', Ap., Je., yel. br.
<i> caudata</i> , 1', Feb., My., yel. br.	<i> verrucosa</i> , 1' Mch., My., grn., yel., br.
<i> kelliana</i> , 1', Je., Sep., grn., br., yel.	

Other Species :—

<i> bidens</i> , 1', My., br. yel.	<i> lanceana</i> , 1', Jan., Sep., yel. br.
<i> brachiata</i> , 1', Jy., Sep., yel., grn., br.	<i> maculata</i> , 2', My., Je., yel., red., br. (<i>syn. Wrayæ</i>).
<i> gireoudiana</i> , 1½', Je., Aug., yel., red.	

BRASSICA.

This genus comprises the several green vegetables that are grown in gardens for use throughout the greater part of the year. They are mostly hardy plants raised from seeds and grown in good soil in the open ground. Particulars of cultivation will be found under *Borecole*, *Broccoli*, *Brussels Sprouts*, *Cabbage*, *Cauliflower*, *Savoy*, *Turnip*, etc. It is interesting to notice here that by many generations of cultivation and selection the wild *Brassica oleracea* of the sea shores has given us the white and red *Cabbages*, *Savoy*s, *Coleworts*, *Borecole*, *Cauliflower*, *Broccoli*, *Brussels Sprouts*, and *Jersey Cabbage*—not a bad record for one humble species, and a fine instance of what may be accomplished in plant improvement.

BRASSO-CATT-LÆLIA.

By compounding three generic titles, the Orchidologists have arrived at the above inelegant name for conveying to the uninitiated that the Orchid referred to (*ord. Orchidaceæ*) is a compound hybrid, or, to coin a phrase, a trigener (trigeneric hybrid). *Brasso-Cattleya lindleyana* crossed with *Lælio-Cattleya elegans* gave the following hybrid :—

lindleyano-elegans, 1', Dec., blush wh., pur.

BRASSO-CATTLEYA.

This title has been given to an Orchid (*ord. Orchidaceæ*) introduced as *Lælia lindleyana*, a natural hybrid between *Brassavola tuberculata* and *Cattleya intermedia*. It is, of course, a purely artificial genus, and its only member is a bigener (bigeneric) hybrid.

lindleyana, 1', Oct., Jan., wh., ro.

BRAVOA.

Pretty bulbous plants (*ord. Amaryllidæ*), which are hardy only in warm districts in sheltered situations, but are very suitable for cultivating in a cold frame or cool greenhouse. They should have a rich, light soil containing some leaf soil and sand. They are propagated by seeds sown when ripe, or by offsets. The best is *geminiflora*, which has spikes of orange red flowers in July, and is about 2' in height. The other species are *bulliana*, 2½', July, white (now *Prochnyanthes bulliana*); *sessiliflora*, 2', June, white; and *singuliflora*, 3', July, greenish white.

BRAYA.

A small group of Alpine Crucifers (*ord. Crucifæræ*). Hardy rock plants.

Principal Species :—

<i> alpina</i> , 3", Ap., Je., pur., wh. (<i>syn. purpurascens</i> and <i>platypetala</i>).	<i> glabella</i> (<i>see alpina</i>).
	<i> purpurascens</i> (<i>see alpina</i>).

BREAK.

When a plant is cut back, side shoots are thrown out from the lower buds, which action is called breaking, the resulting shoots being breaks. A straight-growing stem, *e.g.* of a *Chrysanthemum*, naturally breaks into three or more shoots near its apex, which is technically called its first break; these branches again sub-divide and form the second break, and so on. A florist's Tulip is spoken of as "broken" (rectified) when it quits the "Breeder" stage and assumes its final colours.

BREASTWOOD.

Twiggy shoots of young growth, which spring at right angles from the front of the main branches on fruit trees trained as espaliers in the open, or grown against walls as cordons or trained specimens, are often spoken of as breastwood, though "foreright shoots" is the correct phrase. The term is also applied, and more correctly, to the thin side shoots formed on the main branches of pyramid and bush trees.

BREDIA.

This shrub (*ord. Melastomacæ*) thrives best in a compost of loam and peat, with coarse sand, in an intermediate temperature, and may be propagated by cuttings in very sandy soil under a bell-glass in a warm case.

Only Species :—

hirsuta, 3', Sep., rosy red.

Brazil Nut (*see Bertholletia*).

Bread-fruit (*see Artocarpus*).

BREMONTIERA.

An evergreen shrub from Mauritius (*ord.* Leguminosæ), that requires the temperature of a stove for its successful culture. Cuttings inserted in sand under a bell-glass in bottom heat root freely.

Only Species :—

Amnoxylon, 3½', Ap., pur.

BREVOORTIA.

Ida-Maia is the only species in this genus (*ord.* Liliaceæ), and even this plant is better known under its old name of *Brodiaea coccinea*. It is



BREVOORTIA IDA-MAIA, BETTER KNOWN AS
BRODIAEA COCCINEA.

increased by offsets, which are thrown off freely by healthy bulbs. It likes a sunny, well-drained position with light, rich soil, and should not be disturbed oftener than every three or four years. The flowers are red, tipped with green, and make their appearance in June.

BREWERIA.

Stove climbers (*ord.* Convolvulaceæ), of no great horticultural value.

Principal Species :—

cordata, Jy., Aug., wh. (*syn.* *Roxburghii*).

BREXIA.

Stove trees (*ord.* Saxifragæ), valuable by reason of their handsome leafage. They thrive in large pots or tubs, with fibrous loam and peat in equal proportions. Propagation is effected by cuttings in sandy soil under a bell-glass in bottom heat.

Principal Species :—

chrysophylla (*see* *madagascariensis*). *spinosa* (*see* *madagascariensis*).
madagascariensis, 28' Je.,
gm. (*syn.* *spinosa*).

BRICKELLIA.

A genus (*ord.* Compositæ) that does best in the stove. Increased from cuttings inserted in very sandy soil under a bell-glass in the propagating case. A mixture of peat, loam, and coarse sand suits.

Principal Species :—

Cavanillesii, 2', Sep., pur. *pendula*, 1½', Aug., yel.
grandiflora, red (*syn.* *Eupatorium grandiflorum*). *veronicaefolia*, 1½', Aug.,
pur. bl

BRIDELIA.

Two species appear to represent this genus (*ord.* Euphorbiaceæ) in cultivation.

Principal Species :—

stipularis, cl., Jy., Sep., st., wh. (*syn.* *scandens*).
retusa.

BRIDGES.

As employed in gardens, bridges may be either ornamental or useful, or a combination of both. They are formed generally of stone, iron, or wood, and the size and strength of the structures depend on the uses for which they are required. Where it is necessary to conduct a roadway that is subject to heavy traffic over a river or water-course, a substantial bridge of iron or stonework is necessary; but in order that it shall be in keeping with the surroundings a light, ornamental style of architecture should be adopted. A bridge built for utility purposes may be an ornament or an eyesore to a garden landscape, according to its style. There should be a union between the banks on either side and the bridge, with no abrupt ending of parapet walls. If of wood, this should be of a rugged character, and not spoiled by gaudy paint; if of iron, let it be as light and elegant as possible. The style and character of bridges can only be determined by the position for which they are intended.

BRIER.

The Brier commonly used in gardens as a stock for the Rose is *Rosa canina*, the common Dog Rose of the hedgerows. The stocks are either raised from seeds or procured from the hedges and other places where they grow naturally. The Sweet Brier is *Rosa rubiginosa*, which is prized for its fragrance. It makes a nice hedge for a division in a garden, its sweet scent being then appreciated, particularly after a shower. There are several varieties of the Sweet Brier, the double scarlet being a favourite where it is grown. From the Sweet Brier hybridised with other Roses the late Lord Penzance raised what are known as the Penzance Briers, a beautiful class of much value. The Austrian Brier (*Rosa lutea*) and the foregoing will be found under Rose.

BRILLANTAISIA.

This evergreen shrub (*ord.* Acanthaceæ) comes from Sierra Leone, and requires the temperature of the stove. The soil should consist of loam and peat in equal proportions, and propagation is best effected by cuttings under a bell-glass in bottom heat.

Principal Species :—

owariensis, 3', My., bl. pur.

BRIZA. (QUAKING GRASS.)

Graceful, hardy annual or perennial Grasses (*ord.* Gramineæ), of much value for drying for winter use, or for mixing with cut flowers. They can be grown in loam, peat, and leaf soil, and the native species, *media*, does well in sandy soil. It is a perennial, and grows about 1' high. Other good species are:—

<i>maxima</i> , 1½', Je.	<i>rotundata</i> , 1', Je.
<i>minor</i> , 6", Je. (<i>syn.</i>)	<i>rubra</i> (<i>see maxima</i>).
<i>minima</i> .	<i>spicata</i> , 9", Je.

These are all annuals, and are propagated by seeds sown in spring. *Media* can be increased by division, and raised from seeds also.

BROADCAST.

Broadcast sowing is the rough and ready way of putting in seeds without drawing drills. Sand should always be mixed with fine seeds when they are sown broadcast. The hand should be held low, and a day selected when there is no wind. Drills are, however, as a general rule, so immensely superior to broadcasting that the latter should only be resorted to in rare cases.

BROCCHINIA.

A small genus (*ord.* Bromeliaceæ) closely allied to *Billbergia* and *Bromelia*, and needing similar treatment.

Principal Species:—

cordylinoides, 15', aut., whitish (*syn.* *Cordylina micrantha*).
paniculata, 6', whitish.
reducta, 3', whitish.

BROCCOLI.

Description.—A useful garden vegetable (*Brassica oleracea botrytis asparagoides*, *ord.* Cruciferae), the flower heads of which are edible. Broccolis are hardier than Cauliflowers, and valuable for providing a supply of vegetables in the winter and spring, when Cauliflowers are unavailable. By a proper selection of varieties, and careful management, the supply of Broccoli may be maintained from the autumn to the following summer.

Propagation.—From seeds sown in a frame in March, and in a prepared bed outdoors in April and May for succession, pricking out the seedlings, and finally transplanting 2' apart each way.

Soil.—The rooting medium should be deep, and well manured, but firm. If made loose and friable the plants are apt to make soft, luxuriant growth, and they are unable to withstand the winter.

Other Cultural Points.—Sturdy plants of Broccoli may be obtained by putting them out in ground that has not been recently dug, making the holes with an iron-pointed dibber, and pricking up the surface soil between the plants with a fork. Draw the soil up to the stems as growth increases. To assist Broccoli in withstanding severe frost, lay them over with the heads facing north in November. Take out a trench 1' or 1½' deep, turn over the plants carefully with a fork, and cover the roots with the next spit of soil, broken fine, leaving only the heads exposed. If the weather is very severe, cover each plant with litter.

Enemies.—Protect plants in a seedling stage from the ravages of slugs and small birds with dustings of lime and soot, and garden netting stretched over the beds.

Club Root (*see* CABBAGE ENEMIES).

Gall Weevil (*see* CABBAGE ENEMIES).

Varieties:—

For cutting in the autumn and early winter:—

Michaelmas White.	Snow's Winter White.
Self-protecting.	Walcheren.

For cutting in the late winter and early spring:—

Cooling's Matchless.	Leamington.
Knight's Protecting.	Winter Mammoth.

For cutting in the spring and early summer:—

Eclipse.	Model.
Late Queen.	White Protecting.

Sprouting Varieties:—

Purple Sprouting.	White Sprouting.
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BRODIAEA.

Charming bulbous flowers (*ord.* Liliaceæ) delightful ornaments of rock gardens or borders



BRODIAEA GRANDIFLORA.

in light, sandy soil, and in a warm and sunny position. In cold districts they should have a little covering in winter. Propagated by offsets, taken off when the bulbs are at rest; or by seeds, sown when ripe or in spring. They make pleasing pot plants for the greenhouse or window, and may be potted and grown on gradually without much heat.

Principal Species :—

californica, 1½', Je., ro., pur.
 coccinea, 1½', Je., red, yel. A handsome plant, now called *Brevortia* *Ida-Maia*, which should be as little disturbed as possible.
 congesta, 1', Je., bl. A free-growing species, of which there is a wh. var. named *alba*.
 grandiflora, 1½', Je., bl. pur. One of the prettiest.
 ixioides, 9", Je., yel. A pretty, easily grown plant. The var. *splendens* is superior. Var. *erecta* is fine (*syns.* *Calliprora lutea* and *Milla ixioides*).
 laxa, 1½', Je., bl. One of the best (*syn.* *Milla laxa*).

Other Species :—

Bridgesii, 1½', Je., pur. bl.
capitata, 2', My., bl.
 — *alba*, wh.
Douglasii, 1½', Jy., bl.
gracilis, 4", Jy., yel.
Hendersoni, 1½', Je., yel.
Howellii, 2', Jy., bl.
 — *lilacina*, lil.
lactea (correctly *hyacinthina lactea*), 2', Jy., wh.
 — *lilacina*, wh., lil. (*syn.* *Hesperoscordum lacteum*).
multiflora, 1½', Je., pur.
Orcuttii, 1', Aug., bl.
peduncularis, 1½', Je., wh.
Purdyi, 1', Je., ro. pur.
rosea, 9", Je., pale pur.
stellaris, 6", Je., bl.
uniflora, 6", Ap., Je., wh. to sky bl. (*syns.* *Milla* and *Triteleia*).
 — *violacea*, porcelain bl.
volubilis (climbing), 10', Jy., ro. (correctly *Stropholirion californicum*).

BROMELIA.

A genus of herbaceous perennials (*ord.* Bromeliaceæ) that must be grown in the stove, where they present a handsome appearance. It is important that the soil be kept somewhat dry during the winter months. The stock may be increased from suckers in loam. A rich compost in which loam predominates is most suitable.

Principal Species :—

bracteata (*see* *Æchmea*). *Pinguin*, 3', Mch., red (*syn.* *Binotii*).

Other Species :—

Binotii (*see* *Pinguin*).
fastuosa, 4', Aug., pur. (*syns.* *antiacantha* and *Karatas antiacantha*).
Fernandæ, 2', Aug., yel., red.
laciniosa, lil., leaves 4' to 5' long.
sylvestris, 3', Jy., crim.

BROMHEADIA.

A slender, reed-like Orchid (*ord.* Orchidaceæ), found in swampy places in islands of the Malay Archipelago. It is not difficult to cultivate in peat and sphagnum in a warm stove, where at no season of the year should the roots become dry. It rarely flowers, and consequently is seldom grown.

Principal Species :—

palustris, 1½', My., Je., wh., lip wh., veined vio.

BROMUS.

The genus *Bromus* is a fairly large one, but the species generally grown in gardens, and the most ornamental, is brizæformis, a pretty biennial Grass (*ord.* Gramineæ), which is useful in the garden or among cut flowers, or for drying for vases in winter. It grows about 2' high, and has pretty spikes of drooping flowers like those of the Brizas. It should be sown in the open at the end of June or beginning of July.

BRONGNIARTIA.

A small genus of evergreen shrubs (*ord.* Leguminosæ) requiring greenhouse treatment. Cuttings root freely in sand under a bell-glass. A mixture of fibrous peat, loam, and coarse sand is suitable.

Principal Species :—

podalyrioides, 1', Sep., sericea, 1', Sep., pur. flesh.

BROOM.

The Brooms are very ornamental in the garden or shrubbery, and can hardly be used amiss on rockeries of any size. The plants popularly known by this name include *Cytisuses*, *Genistas*, and *Spartiums*, and these will be found described in detail under their respective titles. They are generally very decorative, and comprise plants of much diversity of habit, some forming tall bushes of graceful foliage, and others being of trailing habit and adapted for hanging over rockwork. Among the best of the Brooms is *Cytisus scoparius*, which has given the brilliant variety *andréanus*. *C. præcox*, supposed to be a hybrid, is very beautiful, and the white Portuguese Broom, *Cytisus albus*, is a favourite with all. Many of the Brooms make fine pot plants, and can be gradually forced so as to bloom early under glass.

BROOM, SPANISH.

This is *Spartium junceum* and *Genista hispanica*, which *see* for particulars.

BROSIMUM.

This genus (*ord.* Urticaceæ) has great economic value. Its fruit is eaten boiled and roasted, and its young branches are valuable food for stock. The gummy exudation is made into rubber. Propagation is effected by cuttings inserted in a propagating case. Rich loam is the best soil, and a stove temperature is essential. *Galactodendron* is the celebrated Cow Tree of South America, yielding a sap closely resembling cow's milk, and as agreeable and valuable for food.

Principal Species :—

Alicastrum, 6', My., grn., Humboldtii (*see* *Galactodendron*).
 Bread Nut.
Galactodendron, 100', microcarpum (*see* *Alicastrum*).
 My., grn.

BROUGHTONIA.

A small genus of Orchids (*ord.* Orchidaceæ) which produce attractive flowers when grown in a warm structure. Propagation may be readily effected by division; and the plants thrive best on blocks of wood, with a little sphagnum moss, and must be accorded a very light position. Although three or four species are known, only one, viz. *sanguinea*, is of material value; the others are rarely cultivated, though *lilacina* is occasionally imported.

Principal Species :—

lilacina, 1½', Je., Sep., ro. sanguinea, 1½', Jy., Aug., lil. (*syn.* *Læliopsis domingensis*). crim.

BROUSSONETIA.

A genus of Japanese trees (*ord.* Urticaceæ), useful for their handsome leafage; they are not perfectly hardy in the colder portions of this country. Propagation is by autumn cuttings, and seeds when procurable. They will grow in any fertile soil.

Principal Species :—

papyrifera, 12', Ap., grn., Paper Tree or Paper Mulberry; cucullata, laciniata, and macrophylla are all varietal forms of *papyrifera*.

BROWALLIA.

These plants (*ord.* Solanaceæ) have been cultivated in this country for many years, but,

Broom (*see* *Besom*).

Brotera of *Cavanilles* (*see* *Melhania*).

with one or two exceptions, have never become very popular. They are almost hardy, but are best grown in pots in the greenhouse, in any fertile soil. They are annuals, raised from seeds sown in March, and repotted as necessary.

Principal Species :—

demissa, 3', Je. to Aug., Jamesoni (see Streptosolen Jamesoni).
bl. (syns. americana and speciosa, 2', Jy., pur.
elata). — major, large.

Other Species :—

grandiflora, 2', Jy., lil. viscosa, 1½', Je., ann. pur.

BROWNEA.

A genus of evergreen trees (*ord.* Leguminosæ) that require the temperature of a stove for their successful culture. They are decidedly ornamental in appearance, and, with care in watering during the winter, demand no particular attention. The flowers are produced in large heads, 8" or 9" across, the brilliant stamens being particularly conspicuous and effective. They thrive in a compost of equal parts of peat and loam, with the addition of some coarse sand. Cuttings do not root very freely; ripe wood should be chosen and inserted in very sandy soil beneath a bell-glass in bottom heat.

Principal Species :—

Ariza, 20' to 40', Je., red. grandiceps, 10', Je., red.
Crawfordii, 18', My., Aug., sc.

Other Species :—

Birschellii, 10', Aug., ro. latifolia, 10', My., sc.
coccinea, 12', Jy., sc. macrophylla, 12', My.,
erecta (see Talisia prin- Aug., sc. or.
ceps). racemosa, 10', Jy., ro.

BROWNLOWIA.

The best species of this genus is a handsome East Indian tree (*ord.* Tiliacæ), and requires the temperature of the stove, where it grows freely in sound loam. Propagation is effected by cuttings in sandy loam.

Principal Species :—

elata, 60', Je., yel.

BRUCEA (*syn.* NIMA).

This is a small genus of stove evergreen shrubs (*ord.* Simarubæ) that flourish in rich loam, and may be propagated from cuttings of the half-ripened growths under a bell-glass in heat.

Principal Species :—

antidysenterica, 8', Ap., grn. sumatrana, 20', My., grn.

BRUCHUS GRANARIUS. (PEA AND BEAN BEETLE.)

All seedsmen and gardeners know quite well what "worm-eaten" Peas and Beans are, though, owing to the careful cleaning seeds usually undergo, the gardener sees few "bored" Peas. The little pest that makes these holes is a very tiny beetle named *Bruchus granarius*; he is a dull brown coloured little fellow, with black, white-dotted wings. The female pierces through the pod while it is yet young and tender, and often deposits a minute egg in each of the tiny Pea seeds; eventually the egg is hatched, and the little caterpillar-like grub produced at once eats away the albuminous parts of the seed, soon turns into the chrysalis stage and subsequently produces the beetle, which eats its way out. It is practically impossible to deal with this little pest other than by burning every questionable seed when the crop has been harvested. Moreover, such seeds are of

little value, as they will either not germinate, or give so weakly a plant that it fails to be productive. *Bruchus Pisi* and *B. rufimanus* are also destructive.

BRUGMANSIA (*see* DATURA and JUANULLOA).

BRUNFELSIA.

These plants (*ord.* Solanacæ) came to us from the West Indies and South America, and comprise several species of value for the stove. They are all evergreen shrubs that produce small but attractive leaves and handsome flowers. The genus formerly known as *Franciscea* is now merged in *Brunfelsia*. A rich, fibrous loam from which all the finer particles have been removed suits them admirably. *Brunfelsias* are easily increased from cuttings inserted in sandy soil beneath a bell-glass in a propagating case. The following synonymy is that of the *Kew Hand-List* :—

Principal Species :—

calycina, 2', My., Je., pale hopeana, 1½', Nov., Jan.,
pur. (syns. confertiflora, bl. (syns. uniflora and
eximia, macrantha, and Franciscea hopeana).
violacea).

Other Species :—

americana, 4', Je., yel. montana, 4', Jy., wh.
latifolia, 4', My., pur. nitida, 3', Jy., yel.
Loekhartii, 3', My., bl. undulata, 4', Je., wh.

BRUNIA.

A small genus of evergreen shrubs (*ord.* Bruniacæ) from the Cape. Most of the plants having any horticultural value, that were originally included in the genus, have been referred to *Berardia*, *Berzelia*, *Raspalia*, and *Staavia*. *Brunia nodiflora*, 1' to 3', July, is a pretty white greenhouse plant.

BRUNNICHIA.

This is an evergreen climber (*ord.* Polygonacæ) from Carolina, which requires a compost of loam and sand and a greenhouse temperature. Propagation is effected by cuttings.

Only Species :—

cirrrosa, 6', Jy., pk. (syns. *Rajania ovata* and *Polygonum claviculatum*).

BRUNONIA.

Australis, 1', May, blue, sweet, is the only species in this genus (*ord.* Goodenoviæ). It is a herbaceous perennial, that thrives better in a frame or cold greenhouse than in the open ground. It may be raised from seeds, or be increased by division; loam and peat form a suitable mixture.

BRUNSVIGIA.

Description.—Brilliant greenhouse bulbous plants (*ord.* Amaryllidæ), which are of great value for the decoration of the conservatory or warm greenhouse. The flowers are in good-sized, many-flowered heads, and are produced at a different time from the broad leaves.

Propagation.—By offsets, sparsely produced from the bulbs; or by seeds sown in a stove or warm greenhouse temperature.

Soil.—Sandy loam and peat suit.

Other Cultural Points.—After making their growth they should be rested and kept dry in a temperature of 65° to 70°. When they show natural growth give a temperature of about 65°, and see that they are freely supplied with water to encourage growth. In very warm places they may be grown in a border against a stove or greenhouse, if deeply planted and well protected in winter by a thick coating of dry litter, covered with some waterproof material, or placed in a frame.

Principal Species :—

gigantea, 1', Jy., red. A fine plant, also known as *multiflora*.

Josephinae, 1½', Jy., sc. A very handsome and desirable plant (*syn.* *Amaryllis Josephinae*).

Other Species :—

Cooperi, 1½', yel., edged red.	Radula, 6'', Je., red (<i>syn.</i> <i>Coburgia Radula</i>).
<i>grandiflora</i> , 1½', Aug., pale red.	<i>slateriana</i> , 1', ro. red (<i>syn.</i> <i>Ammocharis slateriana</i>).
<i>minor</i> , 9'', Jy., pk. (<i>syn.</i> <i>humilis</i>).	

BRUSSELS SPROUTS.

Description.—One of the hardiest, most prolific, and useful members of the Brassica family (*Brassica oleracea bullata gemmifera*, *ord.* *Cruciferae*), producing small, edible sprouts all the way up the stems. The plants require a long season of growth.

Propagation.—From seeds sown under glass in March to obtain early plants. Sow in a bed outdoors in April for succession, pricking out the seedlings when large enough, and transplanting early in June.

Soil.—Good retentive loam is the best for Brussels Sprouts, but they flourish in most garden soils if properly prepared beforehand. Select the site in the winter, manure heavily, dig deeply, and leave the surface in a rough state till planting time.

Other Cultural Points.—Room is one of the chief requirements of Brussels Sprouts, and a distance of 3' should be allowed between the rows, with 2½' from plant to plant. Lift and plant with a trowel, removing each specimen with a ball of soil. Give a soaking of water as each row is put out, and in dry weather during the summer apply liquid manure occasionally. Remove all dead and decayed leaves in the autumn, but do not cut the heads out of the plants till the spring.

Enemies.—In the early stages of growth, seedlings are apt to fall a prey to the ravages of slugs, flea beetle, and small birds. Dust with soot and lime, and protect with garden netting.

Cabbage Aphis (*A. Brassicae*).—In the late summer and autumn Brussels Sprouts are often infested with this pest, which checks growth, and spoils their appearance. Give liquid manure and light surface dressings of nitrate of soda to stimulate growth. Syringe infested plants with an insecticide formed by boiling 1 lb. of soft soap in 1 quart of water for an hour. When boiling add ½ pint of paraffin, dilute with 8 gallons of water, mix thoroughly, and apply with a syringe. Dustings with soot and lime will also check the aphids.

Caterpillar (*see* CABBAGE CATERPILLAR).

Club root (*see* CABBAGE ENEMIES).

Gall Weevil (*see* CABBAGE ENEMIES).

Varieties :—

Aigburth, large.	Exhibition, early, large.
Dwarf Gem, small, fine flavour.	Matchless, medium.
	Scrymger's Giant, large.

BRYA.

A small genus of evergreen shrubs (*ord.* *Leguminosae*), that must be grown in the stove. They are easily propagated by seeds or cuttings, and thrive best in sound, fibrous loam.

Principal Species :—

<i>Ebenus</i> , 12' to 15', Jy., grn. yel.	<i>leonensis</i> , 10', Jy., grn. yel.
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BRYANTHUS.

Small hardy shrubs of trailing habit (*ord.* *Eri-*

caceae). Propagation may be effected by root division, by cuttings, and by layers, in spring. A peaty soil and plenty of moisture are the two things needful.

Principal Species :—

<i>Breweri</i> , 9'' to 12'', sum., ev., ro. pur.	<i>erectus</i> , 1', red, a hybrid.
<i>empetriformis</i> , 6'', sum., red pur. (<i>syn.</i> <i>Menziesia empetrifolia</i>).	<i>Gmelinii</i> , 2' to 3'', red.

BRYONIA. (BRYONY.)

Pretty climbing herbaceous perennial plants (*ord.* *Cucurbitaceae*), with tuberous roots. They grow well in any rich soil. They are increased by division of the tuber, or by seeds. The native Bryony is so scarce in many localities that it may well be grown in rough places in the garden, as well as over hedges and in the wild garden. It is called *dioica*, and has greenish white flowers, succeeded by round, red fruits, which give it a good deal of brightness. There are a few species which need stove heat, but the only one much known is *laciniosa*, which has yellow flowers in July, followed by scarlet berries, striped white. It can be grown in pots, and trained up the rafters.

BRYOPHYLLUM.

Greenhouse succulent plants (*ord.* *Crassulaceae*). Leaves laid upon the soil throw out roots and produce young plants. A good soil should be provided, and perfect drainage; care must be exercised in watering. They have little or no horticultural value.

Principal Species :—

<i>calycinum</i> , 2' to 3', Ap., Jy., grn., pur.	<i>proliferum</i> , 10' to 12', Je., Aug., pur., grn.
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BUCKLANDIA.

In the young state the leaves of *populnea* are very attractive. Though grown as a greenhouse shrub (*ord.* *Hamamelidaceae*), it becomes a tree of considerable height. Propagate by cuttings of ripe wood under a bell-glass in heat. A mixture of leaf mould and rich, fibrous loam is excellent.

Species :—

populnea, 100', Aug., grn.

BUCKLEYA.

A small genus (*ord.* *Santalaceae*) of hardy shrubs. *Distichophylla*, 6' to 12', green, is the only species so far introduced. Propagation is by cuttings in spring, in a gently heated frame. Any ordinary garden soil suits, although a sandy medium is needed for the cuttings.

BUDDING.

This consists of taking a selected bud from the branch of one plant, and inserting it under the bark of another plant of the same or a closely allied species. It forms an easy mode of propagation, and by a careful selection of stocks, dwarfness or vigour, and early or late fertility, are obtained. Among flowers, Roses are the most generally budded, the Brier being the favourite stock on

Bryonopsis (*see* *Bryonia*).

Bubroma (*see* *Guazuma*).

Bucco (*see* *Agathosma* and *Barosma*).

Buchnera (*see* *Sphenandra*).

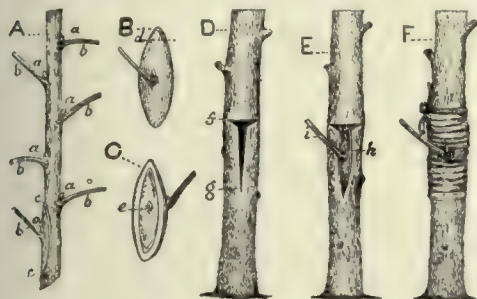
Bucida (*see* *Terminalia*).

Buckbean (*see* *Menyanthes trifoliata*).

Buckthorn (*see* *Rhamnus*).

Buckwheat (*see* *Fagopyrum*).

which to bud, though the De la Grifferaie and Manetti are also extensively employed. Of fruit trees, the Apple is worked on the Crab, Free, and Paradise stocks; and the Pear on the Quince and Pear stocks. The Cherry is budded on the Gean and seedling Morello stocks, for general purposes;



SHIELD BUDDING.

A Shoot of current year's growth, with buds: *a*, buds; *b*, leaf stem; *c*, how to cut out the bud. B Bud cut out: *d*, top cut off after insertion to make level with cut in stock. C Inside face of bud after removal of pith: *e*, growing germ. D Stock: *f*, horizontal cut; *g*, vertical cut. E Bud inserted and pressed home: *h*, bud; *i*, leaf stem. F Bud tied in with soft cotton, raphia, or worsted.

but the Mahaleb stock is used for trees intended for pot or restricted culture. Peaches and Nectarines are worked on the Almond, Mussel, St. Julien, and Myrobalan stocks, as is the Apricot; the St. Julien being employed for standards, and the dwarfing Myrobalan for trained trees. The Plum stock is the natural stock for the Plum, though certain forms, such as the Mussel, White Pear, and St. Julien, are the favourites, and are generally employed. Budding is generally performed in July or August, when the bark rises freely, the latter being a very essential point in successful budding, as bruised or lacerated bark spells failure. Dull, cloudy weather is the most favourable; in bright weather the early morning, before the sun's power is very great, should be chosen, as undue heat and dryness are inimical. Quickness in operating, and dealing with one bud at a time, are obviously advantageous. A supply of broad strands of raphia, a little damp moss in the bottom of a pail, and a sharp, ivory-handled budding knife, are practically all that a budder requires, though a supply of labels on which to record the date of budding may also be added. There are several different modes of budding, but the one generally practised is the T or inverted L method, either of which is equally suitable, though manyshrewd budders declare in favour of the latter. In preparing the stock, carefully rub off the prickles from the part of the branch selected for operating on, which should be the upper surface, and near the junction of the branch with the stem for standards, close to the soil for dwarfs, and make a cut about 1" long, being careful not to penetrate deeper than the bark. Make another transverse cut, so that the two cuts form the letter T; then with the sharp knife blade inserted $\frac{3}{4}$ " below the selected bud make a clean, even cut, bringing out the knife about $\frac{1}{2}$ " beyond the bud, the cut at no time extending deeper than the beginning of the pith. Holding the detached bud by its leaf-stalk firmly in the left hand, gently insert the point of the knife between the

wood and the bark, until the former can be nipped between the point of the knife and the finger and thumb, then with a gentle pressure remove the wood with an upward motion. Next, carefully cut away all the leaf with the exception of $\frac{1}{4}$ " of its footstalk, which should be held in the left hand. The bark of the shoot should be gently raised with the handle of the knife held in the right hand, and the bud inserted beneath the bark and pressed home. Care should be used not to injure the bark in raising it or in inserting the edge of the bud beneath it, and in ensuring that the upper end of the bud fits closely against the undisturbed bark at the top of the T. Close the bark carefully over the bud after it is placed in position, and bind the whole of the slit portion moderately firm with the broad strips of raphia, taking care that the bud itself is left uncovered. The quicker the whole operation is performed the greater the chance of success. Should any hitch occur in any shape or form, the bud should be laid on the damp moss in the pail, and a little moss also applied to the cut bark while matters are set right, as thereby the drying of the tender tissues will be avoided. In about three weeks' time the buds should be examined, and the ties removed if it is seen that the bud has taken well. If any doubt is felt upon this head, a fresh tie may be given, which may be allowed to remain until spring, or removed at discretion. At the turn of the year the branch on which the bud is inserted may be shortened to half its length.



VARIOUS FORMS OF BUDDING.

G Inverted shield budding: *j*, transverse cut; *k*, longitudinal incision, preferably below a bud; *l*, point of cutting across bud after insertion so as to exactly join the section *j* of the stock. This mode of budding is preferred for the propagation of the Orange in the south of France, and is good generally. H Square shield budding: *m*, square patch of bark cut out of a stem or branch; *n*, corresponding patch of bark with an eye for inserting in that of stem or branch *m*, the parts fitting exactly. Square shield budding is sometimes adopted for spring budding to secure growths at desired places, as in the case of bare stems or branches. I Flute budding: *o*, cylinder of bark taken off top of stock; *p*, prepared cylinder of bark with buds made to fit the bark of the stock at the lower part, thus fitting like the top of a flute. Walnuts, and other thick-barked trees, are propagated in France by this mode. If the ring is too large for the stock, a longitudinal strip should be cut out; and if too narrow, a strip to make good the deficiency must be inserted—if with a bud all the better. J Annular budding: *q*, ring of bark taken off from the stock; *r*, ring of bark taken off from a scion of the variety to be budded in, and having at least one or two buds. It must fit exactly on the space *q*. K Square budding with a dormant bud in spring, showing the exact fitting of the edges of the barks, and applicable to square shield budding. L Inlaying a bud in a Vine: *a*, place from which a bud has been taken or a position similarly prepared for placing one; *b*, bud inserted in the stock. The buds, in all cases, should be secured with ligatures so that the inner bark of the buds rests closely on the albumen or outer layer of wood of the stock.

and when the bud has fairly started into growth the remaining portion may be removed with a sharp knife to within 1" of the bud. Care should be taken that the bud and its resultant growth is not wrenched out of place by high winds; to prevent this, a stake may be bound to the top of the stock, to which the young growths may be secured. Other methods of budding which are often employed for thick-barked trees are: Flute or tube, and ring-budding, and the American shield budding, which differs chiefly from the T, or common shield budding, in allowing the bud to retain a portion of the wood removed with it from its parent.

BUDDING KNIVES.

Knives are specially designed for budding Rose and fruit trees, being provided with a flattened handle tip for raising the bark. An oil- or whet-stone should be used for keeping the edge of the blade keen, as a rubber, though often employed, gives the knife a rough edge, which tears and fractures the delicate bark of bud or stock in a way detrimental to a proper union.

BUDDLEIA.

This genus (*ord.* Loganiaceæ) is composed principally of stove and greenhouse evergreen shrubs that serve well to diversify the collections in those structures. The chief hardy species is *globosa*, but this should have a warm and well-drained position selected for it in cold localities; it is readily propagated from cuttings of ripened wood inserted under a hand-light and afforded protection in severe weather. The tender species are increased in a similar manner, but with the greater heat common to the structures in which they thrive. A compost of sound loam, with a little fibrous peat and sand if close, suits admirably.

Principal Species :—

Colvillei, 6', Je., ro. variabilis, 10', Jy., Aug.,
globosa, 15', My., hdy., or. rosy lil.
(*syn.* capitata).

Other Species :—

americana, 10', Aug., yel. lindleyana, 6', st., vio.
asiatica, 3', Aug., grh., wh. madagascariensis, 10', Jy.,
brasilensis, 9', Ap., or. or. (*syn.* heterophylla).
diversifolia, 6', Ap., red. Neemda (*see* asiatica).
intermedia (hybrid), hdy., paniculata, 13', Je., pur.
pur. (*syn.* crispa).
japonica, Aug., hdy., pur. thyrsoides, 4', Aug., yel.
(*syn.* curviflora of gar-
dens).

BUDS.

Buds may be divided into two sections—leaf buds and flower or fruit buds. A leaf bud resembles an embryo plant, and if placed under favourable conditions for rooting would develop into a similar plant to that from which it was taken. The small bulbs, or bulbils, frequently produced in the axils of the leaves of bulbous plants, are true buds, and when they become detached from the parent stem fall to the earth and ultimately root and grow. Underground buds are well illustrated in the case of the Potato, the tubers of which are subterranean stems bearing numerous buds or eyes.

BUETTNERIA.

Stove shrubs (*ord.* Sterculiaceæ) of no special horticultural value. They grow well in fibrous loam and coarse sand. Propagation is by cuttings inserted in very sandy soil beneath a bell-glass in bottom heat.

Principal Species :—

dasyphylla, 3', Je., wh. wh. (correctly *Rulingia*
(correctly *Rulingia* pan- *hermanniaefolia*).
nosa). microphylla, 4½', Je., wh.
hermanniaefolia, 3', Je., pur.
pur. scabra, 6', Jy., pur.

BULBINE.

Description.—Pretty plants of annual or perennial habit (*ord.* Liliaceæ), having fibrous or bulbous roots and effective, rather sweet scented, flowers.

Propagation.—The bulbous species by offsets or seeds; the shrubby-habited by cuttings struck under glass; and the herbaceous plants by division or suckers.

Other Cultural Points.—A rich but light sandy loam suits. The Bulbines do best as greenhouse plants, but the pots in which they are grown may be plunged outside in summer. The annual species, *annua*, may do well in warm situations if the seeds are sown in gentle heat in early spring and the plants transferred to where they are to bloom when large enough.

Principal Species :—

alooides, 1', Ap., yel. A useful greenhouse plant with a handsome head of flowers (*syn.* *Anthericum* *alooides*).

annua, 10'', Je., yel. A pretty annual, seldom seen in gardens.

frutescens, 2', Ap., yel. Of shrubby growth (*syn.* *caulescens*).

Other Species :—

asphodeloides, 2', Jy., wh. longiscapa, 1', Je., yel.
(*syn.* *Anthericum* aspho- (*syn.* *Anthericum*
deloides). longiscapum and *A.* *alt-*
bulbosa, 1', Je., yel. tissimum).
latifolia, 2', Jy., wh. (*syn.* semibarbata (*see* bulbosa).
Anthericum latifolium).

BULBINELLA.

These yellow-flowered plants (*ord.* Liliaceæ) are often united to *Anthericum* and *Chrysobactron*, but *Bulbinella* is the correct name. Both species are natives of New Zealand, and need to be grown in a greenhouse.

Principal Species :—

Hookeri, 2', sum., yel. Rossii, 2', early sum., yel.

BULBOCODIUM.

Pretty spring flowering hardy bulbs (*ord.* Liliaceæ) bearing some resemblance to the *Crocus*, but distinct botanically. There are few species in cultivation, and the only one available is known in gardens as *vernum*, a handsome little plant with broad leaves and purple flowers in February. It likes a sandy soil, and should be protected from slugs before the flowering time. It is propagated by offsets or seeds. There is a pretty, but scarce, variety named *versicolor*. The flowers are distinct in their colour from *Crocuses*.

BULBOPHYLLUM.

Description.—A large genus of Orchids (*ord.* Orchidaceæ), chiefly with small and rather curiously shaped flowers. Very few of them are of any horticultural value, although they are of exceptionally easy culture. The flowers are in most cases produced in long, many-flowered spikes or racemes; in *Lobbii*, however, they are borne in pairs. Beccari, in addition to being a climber, is noteworthy on account of its foetid odour, as well as being one of the largest known members of the Orchid family.

Propagation.—By division of the pseudo-bulbs; and by seeds where they can be obtained.

Soil.—Very little soil is required, except in the case of *Lobbia siamense*. The plants should be bound firmly to blocks of wood, with a little fibrous peat and sphagnum moss worked here and there in the spaces between the roots. *Lobbia siamense* likes a full compost of peat and sphagnum, with plenty of drainage.

Other Cultural Points.—*Bulbophyllums* need plenty of water while they are making their growth, but less when they are undergoing their annual rest. Water must not be entirely withheld, however, or the roots and the pseudo-bulbs will shrivel, and the existence of the plants be imperilled.

BULBS.

Bulbs are leaf buds with fleshy scales. Many bulbous plants are greatly to be recommended for culture in glasshouses, as, when their flowering season is past and the foliage matured, many of them may be stored until growth commences again in the spring; thus affording room on the stage for other plants. Well known examples of bulbous plants which lend themselves to this treatment are *Amaryllises*, *Crinums*, and *Freesias*.

Dutch bulbs, such as *Hyacinths* and *Tulips*, are largely imported for forcing purposes; though, pleasant to relate, home growers have recently successfully entered into competition with the Dutch growers. These bulbs, if intended for indoor decoration, are placed in pots as soon as



Photo: E. J. Wallis, Wandsworth, S.W.

BULBOPHYLLUM MEDUSÆ.

Principal Species:—

barbigerum, 3", sum., st.,
grn., br.
Ericsoni, 1', Mch., yel.,
wh.
grandiflorum, 8", sum.,
grn., brn.
Lobbia, 6", sum., st., yel.,
spotted pur.

— *burfordiense*.
— *siamense*, sum., warm
grh., yel., striped pur.
reticulatum, 6", sum., st.,
wh., flowers in pairs.
sillemianum, 4", Ap., or.,
mauve, wh.

Other Species:—

amplum (see *Dendrobium amplum*).
auricomum, 8", Dec., wh.
Beccari, st., br., vio.,
cl.
comosum, 6", spr., wh.
dayanum.
Dearei (syn. *Sarcopodium*
Dearei).
elegans, 3", Je., ro. pur.
godseffianum (syn. *Sarcopodium*
godseffianum).
mandibulare, 1', Dec., yel.,
grn., yel.

Medusæ, pale yel., dotted
pk. (syn. *Cirrhopetalum*
Medusæ). (See figure.)
psittacoglossum (syn. *Sarcopodium*
psittacoglossum).
saltatorium, 6", win., st.,
grn., br.
saurocephalum, 6", spr.,
pale yel., wh.
tremulum, 6", My., wh.,
red pur.

received, and plunged beneath 4" of ashes or Coconut fibre, until top growth commences; by this time the pots are full of roots, when they may be transferred to a cold frame for a few days, and thence removed to the forcing house or greenhouse as circumstances dictate. Other bulbs which are profitably grown in pots under glass are *Liliums auratum*, *candidum*, *longiflorum*, and *speciosum*. For details of culture and selections of varieties see the various plants.

BULLACE.

The black Bullace (*Prunus insititia*) is indigenous to Britain, and is occasionally found growing in hedgerows in various parts of the country. The abundantly produced fruits are used in puddings and pies, but their inferiority of flavour as compared with Damsons and cultivated Plums is bringing them into disfavour. The fruit does not develop its full flavour until it has been frosted. An infusion of the flowers with sugar is said to be a mild cathartic.

BUMELIA.

Hardy or greenhouse trees and shrubs from North America and the West Indies. Many

Bugloss (see *Anchusa*).

members of the genus (*ord.* Sapotaceæ) were formerly in cultivation, but now only about three are grown.

Principal Species :—

lanuginosa, Jy., Aug., wh. lycioides, Aug., wh.
retusa, st.

BUNCHOSIA.

Stove shrubs (*ord.* Malpighiaceæ) of some ornamental value. Canescens attains to tree form. Cuttings of ripe growths root in very sandy soil in heat. A mixture of fibrous loam and peat with sand is the best.

Principal Species :—

argentea, 9', Jy., yel. nitida, 10', Jy., red.
canescens, 20', Jy., yel. odorata, 10', Jy., yel.
glandulosa, 10', Ap., yel.

BUNIAS.

A few small growing plants constitute this genus (*ord.* Cruciferae), but they are of no special horticultural merit. Hardy.

Principal Species :—

Erucago, Je., Jy., yel. orientalis, My., Je., yel.
(*syn.* aspera).

BUPHANE.

Bulbous plants (*ord.* Amaryllideæ), well adapted for greenhouse culture, with rather handsome flowers. The cultivation they require is the same as that of the Brunsvigias, to which they are allied, and which should be referred to for cultural directions. The species are ciliaris, 9'', purple, and disticha, 1½', October, pink. The former is also known as Amaryllis, Hæmanthus, Brunsvigia, and Coburgia ciliaris; and the latter as Amaryllis disticha, Hæmanthus toxicarius, and Brunsvigia toxicaria.

BUPHTHALMUM.

Showy, hardy herbaceous plants (*ord.* Compositæ), of much value in the garden. They are propagated by division of the roots in spring or autumn, or by seeds sown in spring in the open or in a cold frame. They like a rich soil, and a fairly sunny position in the border. The following are the best of the genus which are in cultivation :—

grandiflorum, a fine form yel. (*syn.* Telekia speciosissima).
of salicifolium. speciosum, 5', Jy., yel.
salicifolium, 1½', Je., (*syn.* cordifolium and
yel. Telekia speciosa).
speciosissimum, 2', Jy.,

BUPLEURUM. (HARE'S EAR.)

A rather large genus (*ord.* Umbelliferae) of annual, herbaceous, or shrubby plants for the border, rock garden, or greenhouse. Few are of horticultural value, and they can hardly be recommended except to those who like to grow plants more noteworthy for their curiosity than beauty. The annuals are propagated by seeds sown in spring; the perennials by seeds or division, the latter in autumn or spring; and the greenhouse shrubby species by cuttings or seeds. A dry soil of a rather sandy character is necessary.

Principal Species :—

diforme, 2', Aug., grh. petraeum, 6'', Je., yel. A
shr., yel. (*syn.* fruti- neat per., with grassy
cans). lvs. (*syn.* graminifolium of Vahl).
fruticosum, 3', Jy., yel. stellatum, 9'', Jy., yel. A
A hdy. ev. shr., pale neat Alpine (*syn.* graminifolium of Favre).
grn. lvs. (*syn.* frutescens).

Other Species :—

aureum, 1', My., per., yel. junceum, 9'', Jy., ann.,
fruticescens, 1', Aug., hdy. yel.
shr., yel. (*syn.* hispanicum). longifolium, 2', Je., per.,
yel.
gibraltarium, 3', Je., paniculatum, 1½', Jy.,
hlf-hdy. shr., yel. per., yel.
glaucum, 6'', Jy., ann., ranunculoides, 1', Jy.,
yel. per., yel. (*syn.* graminifolium of Lapeyr).
graminifolium (*see* petraeum, ranunculoides, and stellatum). rotundifolium, 2', Jy.,
ann., yel.

BURBIDGEA.

Of this genus (*ord.* Scitamineæ) nitida, a beautiful stove herbaceous perennial, is the only species. It grows about 3' in height, and produces orange red flowers in summer. Propagation is readily effected by division. Soil, loam, leaf mould, peat, and sand.

BURCHELLIA.

A small genus (*ord.* Rubiaceæ) of stove evergreen shrubs that delight in a mixture of fibrous loam, peat, and coarse sand. They must have good drainage, and be watered with care. Cuttings of half-ripened shoots root well in sandy soil in heat.

Principal Species :—

capensis, 4', Mch., sc.

BURLINGTONIA (see RODRIGUEZIA).

BURNET.

In olden times Burnet (*Poterium Sanguisorba* and *P. officinale*) was a much more popular herb than nowadays, and had a place, in one or other of its species, in the herb border of every well-appointed garden. The leafage has a very cooling effect, and a flavour resembling Cucumber; and for these reasons it was much employed in the production of an old English drink known as "cool tankard." The generic name is a reminder of this usage, as it is from the Latin *poterium*, a drinking cup.

BURSARIA.

Bursaria spinosa is an attractive evergreen shrub (*ord.* Pittosporæ) for the greenhouse; it flowers profusely if grown in sandy loam and peat in equal parts. Propagation, by cuttings of the young shoots in sand, in heat. 10', October, white.

BURSERA.

A small genus (*ord.* Burseraceæ) of stove trees that are said to possess some economic value, and are used for hedges in South America. Cuttings root readily under a hand-glass in very sandy soil over bottom heat. Soil, peat and loam in equal proportions.

Principal Species :—

australasica, 20', Je., wh. gummifera, 20', Je., wh.
grn. grn.

BURTONIA.

This small genus of greenhouse evergreen shrubs (*ord.* Leguminosæ) abhors stagnant moisture, and must be grown in loam, fibrous peat, and coarse sand, over perfect drainage. Propagation, by cuttings in sand beneath a bell-glass, or by seeds when procurable.

Burning Bush (see Dictamnus Fraxinella.)

Principal Species :—

conferta, 2', Jy., vio. (*syn.* *scabra*, 1½', Je., yel. (*syn.* *violacea*).
pulchella).
villosa, 2', My.

BUTCHER'S BROOM.

The plant popularly known by this name is *Ruscus aculeatus*, which will be found under *Ruscus*. There are only a few members of the genus, which belongs to *ord.* Liliaceæ, and all are interesting plants which can be grown in common soil, and will thrive in shade. They are suitable for borders, the front of the shrubbery, or rock gardens.

BUTEA.

This genus of gorgeously flowered trees (*ord.* Leguminosæ) is comparatively rare in this country. The species *frondosa* and *superba* have some economic value, as an excellent dye is obtained from their flowers; the former is the Dhak or Pulas tree of India. They flourish in peat and loam, and may be increased by cuttings in sand beneath a bell-glass in bottom heat.

Principal Species :—

frondosa, 40', sc. *parviflora*, 35', sc. (*Spat.*
superba, 35', sc. *hilobus* Roxburghii.)

BUTOMOPSIS.

A genus (*ord.* Alismaceæ) closely allied to *Butomus*, and needing similar conditions, with the exception of warmer treatment.

Only Species :—

lanceolata, 1', Je., wh., st. (*syn.* *Butomus latifolius*).

BUTOMUS. (FLOWERING RUSH.)

A pretty hardy aquatic plant (*ord.* Alismaceæ) adapted for shallow water near the edges of ponds and tanks. *Umbellatus* grows about 2' high, has pink flowers in June, and is easily grown in rich loam, about 6" deep, and with from 6" to 12" of water over the crowns, although it does not object to more or less water. It is propagated by division of the roots in spring. It is perfectly hardy, and only requires to be kept from spreading too much when it becomes established.

BUXUS. (BOX.)

A genus of handsome evergreen shrubs or trees (*ord.* Euphorbiaceæ), valuable for the garden or shrubbery, the dwarf form of *sempervirens* known as *suffruticosa* being that so largely used for edgings (*see* Box Edgings). Propagated by cuttings of the young shoots, division, suckers, or layers; occasionally by seeds. The Box prefers a light soil, well drained, but not too dry.

Principal Species and Varieties :—

balearica, 8'. A handsome but rather tender species.

sempervirens, 8'. The most useful of all, and one which gives a number of valuable varieties. Among these may be named as desirable: *argentea*, *aurea*, *marginata*, *myrtifolia*, *rosmarinifolia*, *suffruticosa*, *thymifolia*, and *wallichiana*.

Other Species :—

australis, 6', tender. *japonica*, 8'.
Fortunei, 6' (*syn.* *longifolia* of gardens).

Butter-bur (*see* *Petasites*).

Buttercup (*see* *Ranunculus*).

Butterfly Flower (*see* *Schizanthus*).

Butterfly Orchid (*see* *Oncidium Papilio*).

Butterwort (*see* *Pinguicula*).

BYBLIS.

This greenhouse plant (*ord.* Droseraceæ) should be grown in loam, fibrous peat, and sphagnum, kept continuously moist. It may be raised from seeds. It is small, but attractive and interesting, owing to the glandular hairs.

Principal Species :—

gigantea, 9', Nov., pur. *liniflora*, 4', My., bl.

BYRSONIMA.

A genus of stove evergreen shrubs and trees (*ord.* Malpighiaceæ) that thrive in rich loam, and may be raised from cuttings of the ripe wood in sand under a bell-glass with bottom heat. The bark is used by tanners.

Principal Species :—

altissima, 55', Jy., wh. *lucida*, 5', Je., pk.
crassifolia, 15', Jy., yel.

Other Species :—

chrysophylla, 10', Aug., yel. *pallida*, 4', Jy., Aug., yel.
coriacea (*see* *spicata*). *spicata*, 6', Aug., yel.
laurifolia, 10', Jy., yel. *verbascifolia*, 6', Jy., red.
Moureila (*see* *crassifolia*). *volubilis*, 10', Aug., cl.,
nervosa, 8', Jy., yel. *yel.* (now *Hiræa simsiana*).

BYSTROPOGON.

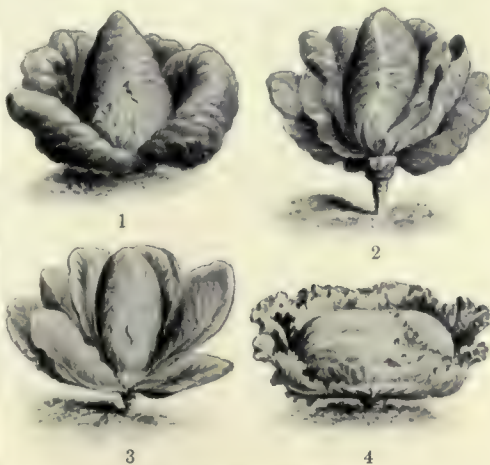
Greenhouse evergreen shrubs (*ord.* Labiatæ) requiring a mixture of peat and loam. Cuttings in sand or very sandy soil beneath a bell-glass root freely.

Principal Species :—

canariensis, 1½', Jy., pur. *plumosus*, 1½', Je., Aug.,
organifolius, 1½', Je., Jy., pur. *pur.*
pur. *punctatus*, 1½', Je., Sep.,
pur.

CABBAGE.

Description.—In a wild state the Cabbage (*Brassica oleracea*, *ord.* Cruciferae) grew freely on the cliffs near the seashore in various parts of



TYPES OF CABBAGE.

1 Early Etampes. 2 Early York. 3 Sugarloaf.
 4 Drumhead.

Great Britain, and it is from this plant that the numerous garden varieties have originated. Amongst green vegetables the Cabbage has no superior for usefulness, and by careful management, and the

selection of suitable varieties, useful heads may be obtained over the greater part of the year. The Red Cabbage is chiefly used for pickling purposes.

Propagation.—From seeds sown outdoors late in July and in August for spring cutting, in March for summer and autumn use, and in June for the late autumn and winter. Red Cabbage is best sown in August, but plants may be raised by sowing over a slight hotbed in February or March. In all cases the soil should be broken down fine, the seed sown broadcast, and dusted with sifted wood ashes as a preventive against insects.

Soil.—The Cabbage is not exacting as regards soil, but prefers a deeply worked medium in a fair state of cultivation. A sheltered south border is a good site for plants intended for early spring use. When Cabbage closely follows a previous crop like early Potatoes, the ground should receive a coating of manure and be dug, but must be made firm.

Other Cultural Points.—On no account should seedlings be left to overcrowd each other in the seed bed before being transplanted. If thinned at an early stage, the plants may be removed direct from the seed quarters to the permanent bed; but rather than allow them to become elongated through overcrowding, the seedlings should be pricked off into a nursery bed. A common failing with spring Cabbage is the habit, in some seasons, of running to seed in the spring instead of forming heads. Some varieties are more apt to do this than others, and the trouble may be obviated to a great extent by sowing at the end of July and again about the middle of August, selecting the sturdiest specimens for transplanting, and choosing a variety like Ellam's Early. Plants put out in the autumn should have the soil drawn up to the stems early in November, and be left for the winter. Hoe between the plants in March and make good any failures with reservations left in the seed bed for the purpose. When heads are forming, light surface dressings of nitrate of soda, hoed in at the rate of $\frac{1}{2}$ oz. per square yard, once a fortnight, are highly beneficial. After the heads are cut, trim off the old leaves, and the stalks may be left to furnish sprouts in the summer and autumn. Plants from spring and summer sowings should be put out in showery weather as ground is cleared of other crops. Compact Cabbages may be planted 15" apart, in rows 18" asunder, but large varieties should be given another 6" each way.

Select Varieties:—

For early spring use:—

Cannell's Defiance Improved.	Early York.
Ellam's Early, one of the best.	Flower of Spring, compact and dwarf.
	Mein's No. 1.

For late spring and summer:—

Cattell's Reliance, medium.	Enfield Market.
Defiance, large and vigorous.	Nonpareil, one of the best.

For autumn and winter:—

Hardy Green Colewort.	Rosette Colewort.
Drumhead.	Winnigstadt.

Varieties of Pickling Cabbage:—

Dwarf Blood Red.	Red Dutch.
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Enemies.—*Birds.*—Sparrows and other small birds are troublesome, through devouring the seeds and seedlings in the beds. They should be checked by stretching garden netting over the beds. In severe weather in the winter larks and linnets injure the plants by eating the leaves.

The best preventives are scaring or shooting the birds.

Aphis (Aphis Brassicae).—During periods of drought, and when plants are growing in poor, light soils, they are apt to be attacked by hordes of this Aphis, particularly in the summer and autumn. The increase is rapid, and if prompt measures are not taken growth is seriously affected. Good cultivation is the best preventive. Assist the plants with a little stimulant. Dust affected plants with lime and soot when damp with dew, and syringe with quassia water.

Moth (Pieris Brassicae).—The larvæ of this well-known moth are very destructive to nearly all members of the Cabbage family, devouring the leaves, and eating their way into the hearts. The moths are on the wing from May and June onwards through the summer, and deposit eggs on the leaves of the Cabbage. The caterpillars, which are green, variously marked with grey or black, have voracious appetites, and play havoc with the leaves and hearts of the plants through the months of July, August, and September. When full-fed they bury themselves in the ground, and remain in the pupa state through the winter. When digging the ground, pick out all the chrysalids and burn them. Destroy the moths when seen flitting about in the summer. Hand-pick the Greens when caterpillars appear. This is the most effective remedy when done regularly. Dust the plants with soot and lime. Syringe with a brine solution.

Fly (Anthomyia Brassicae).—This fly makes its appearance in the summer, and the females, which are of an ashy grey colour, deposit eggs beneath the skin of the root stems. When the caterpillars are hatched they eat the soft parts, and burrow through the stem and roots, causing a disease to set in which is often mistaken for club root. The drooping of plants in the sun, and a sickly yellow appearance of the leaves, are signs of the trouble. Dress the ground with lime after the crop has been removed. Dip the roots and stems before planting in a puddle formed of soot, lime, clay, and water. Prevent attacks by soaking 1 quart of paraffin in 1 bushel of sand, and scattering it amongst the plants in the seed bed.

Snowy Fly or Powdered Wing (Aleyrodes proletella).—This little white-winged fly, which is only about $\frac{1}{16}$ " long, is produced in some seasons in innumerable quantities, and damages Greens of all kinds by extracting the juices from the leaves. The moths infest the under sides of the foliage, and when disturbed they rise in the air in small clouds. These pests seem to settle in chosen localities, from which it is a difficult matter to expel them. A complete rotation of crops should be adopted in bad cases. Remove dead leaves and rubbish from round the plants, and burn them. Apply a dressing of lime to the ground after removing the crop.

Flea Beetle (Haltica nemorum).—In dry seasons this destructive little beetle plays havoc with Cabbages in a seedling stage by devouring them, and when matured by feeding on the leaves. Old plants are generally affected the worst when growing in hot, exposed positions, where the rooting medium is shallow or poor. Dust the seedlings with soot, lime, and fine road dust when they are damp with dew. Apply liquid manure and top-dressings of nitrate of soda to established plants to encourage vigorous growth.

Gall Weevil (*Centorrhynchus sulcicollis*).—Various members of the Brassica tribe suffer through this pest. The insect is fully developed early in the summer, and deposits eggs on the lower portion of the stem, beneath the ground. The grubs feed on the soft part of the stem and the main roots, and the irritation causes galls to appear. If these are cut open they are found to contain white grubs. Gall Weevil is often confounded with Club Root. After removing the crop, dress the ground in the autumn with gas lime, at the rate of 1 peck to the square rod (30½ square yards), or quicklime at the rate of 1 bushel to the rod. Allow either to remain on the surface a few weeks before digging in. Avoid planting a similar crop on the same ground the next season. Remove the galls from the stems of affected seedlings, and dip the plants in a puddle of soot, lime, clay, and water. Scatter sand, in which paraffin has been soaked, among the plants in the seed bed.

Club Root (*Plasmodiophora Brassicæ*).—Anbury, Club Root, and Finger and Toe are names by which this destructive fungoid disease is known. A slight swelling of the root is the first sign of the fungus, followed by a knotted, club-like appearance, which prevents the roots from performing their functions, and the plant collapses. When the disease is in an advanced state the roots become very much contorted, and a mass of rotteness. After the decay of the roots, the spores are liberated, and remain in a resting state in the soil for one or two years. This should be borne in mind, and no crop liable to the fungus grown on the infested ground for a few seasons. Burn all diseased stems and roots. Apply gas lime in the autumn, and quicklime at the rate recommended for Gall Weevil. Dip the roots and stems, before planting, into a puddle of lime, soot, clay, and water. Burn all specimens that betray signs of the disease. Avoid light, sandy soil if possible. Earth up the stems when the plants are half grown, to encourage surface roots.

CABOMBA.

A genus of small aquatic plants with yellow flowers (*ord.* Nymphaeaceæ), which are mostly suited for growing in the greenhouse in summer and in a cool place in the stove in winter. They require water about 1' deep, with 2" or 3" of good soil in the bottom. The principal species is *aquatica*.

CACOUCIA.

Tropical climbing shrubs (*ord.* Combretaceæ), characterised by terminal racemes of bright-coloured flowers. Propagation is effected by cuttings of half-ripened shoots, and other cultural requirements are met by a warm, moist house, and a mixture of peat, loam, and sand.

Principal Species :—
coccinea, My., sc.

CACTUS.

Description.—A name often applied collectively to the various genera of Cactææ. The family is confined to the arid desert and mountainous regions of the warmer parts of America and adjacent islands, though some species have become naturalised in other countries. The chief characteristics of the order are readily noticed, both in

habit and flowers. All come under the heading of shrubs or small trees, and are distinguished by succulent, curiously angled, or flattened stems—which in most cases are leafless—and multitudinous clusters of fine, sharp hairs or bristles, as in *Opuntia* and *Mammillaria*; or long, stout, horny spines or flattened hooks, as in *Cereus* and *Echinocactus*. They vary to a great degree in habit, some of the dwarf *Mammillarias* being barely 1" high and having the stems crowded together in large, cushion-like masses. Others, as in *Echinocactus*, make large, globular stems, 18" high; while some *Cereuses* make single columnar stems 20' or more in height. *Opuntia* and *Phyllocactus* are quite different again, by reason of their flat branches. The flowers are remarkable on account of the large number of highly coloured sepals and petals, which in many instances are very much alike. The stamens are thread-like, indefinite in number, and fall to one side of the flower. The fruits of several species are edible, the best known being the Indian Fig (*Opuntia Ficus-indica*). In tropical and sub-tropical countries the stronger *Opuntias* are used as hedge plants.

Propagation is effected by means of seeds, cuttings, division, or grafting. Seeds should be sown in a mixture of loam and leaf mould, to which has been added an equal bulk of sand and small crocks, pots being used which have previously been half filled with crocks. Cuttings may be made of any portion of a stem, and they must be dried in the sun for several days before insertion in a similar compost to that used for seeds. In cases where plants make dense tufts of stems, division at the time of potting may be tried. In a few instances grafting is resorted to, the method known as "inverted saddle" being adopted. A house with a minimum temperature of 60° and a dryish atmosphere, is well adapted for propagation. For small seedlings and unrooted cuttings very little water is necessary.

Soil.—Good fibrous loam should form the foundation of the potting material. To an equal bulk of this should be added sand, broken sandstone, or brick rubbish. Pots should be filled to a depth of one-third with drainage, and the soil pressed firmly about the roots. During March and April is the best time to pot. If a rockery is made and the plants are planted out, better results are obtained.

Other Cultural Points.—Water is given in summer, but less than is supplied to other plants. After August the supply must be gradually withheld until the end of September, after which time, with one or two exceptions, little or no water will be required until spring. Modifications of this treatment will be mentioned with each genus when necessary.

Principal Genera :—

<i>Cereus</i> .	<i>Mammillaria</i> .
<i>Echinocactus</i>	<i>Opuntia</i> .
<i>Epiphyllum</i> .	<i>Phyllocactus</i> .

Other Genera :—

<i>Echinocereus</i> (<i>see</i> <i>Cereus</i>).	<i>Nopalea</i> .
<i>Echinopsis</i> (<i>see</i> <i>Cereus</i>).	<i>Pelecypophora</i> .
<i>Eriosyce</i> .	<i>Pereskia</i> .
<i>Melocactus</i> .	<i>Pilocereus</i> (<i>see</i> <i>Cereus</i>).
	<i>Rhipsalis</i> .

For particulars *see* each genus.

Cacalia (*see* *Emilia* and *Senerio*).

Cactus Dahlia (*see* *Dahlia*).

CADIA.

An African genus (*ord.* Leguminosæ), interesting on account of its pendulous, Hibiscus-like flowers. A few species only are known. Seeds or cuttings. A mixture of loam, leaf mould, and sand, and an intermediate temperature, suit them well.

Principal Species :—

ellisiana, 2', Jy., ro.

CÆSALPINIA.

A genus of deciduous or evergreen, stove, greenhouse, or hardy trees and shrubs (*ord.* Leguminosæ), characterised by large, handsome leaves, spiny stems, and long racemes of red or yellow flowers. The species requiring protection are rarely seen in cultivation, as they require to be grown to a large size before they flower. Cuttings are difficult to root, but seeds germinate freely. All require a rich, loamy soil. *Sepiaria* is hardy in the southern counties.

Principal Species :—

coriaria, 30', Jy., yel., wh. japonica (*see* *sepiaria*).
(Divi-Divi). Thereddish pulcherrima, 15', Jy., yel.,
br. curved pods are red.
much used in tanning Sappan, 40', Jy., st., yel.
and dyeing. (Sappan Wood).
Gilliesii, 8' to 10', sum., sepiaria, 60', Ap., hdy.,
hdy., yel. (*syn.* Poin- yel.
ciana Gilliesii).

CÆSIA.

Australian and New Zealand plants (*ord.* Liliaceæ), resembling *Anthericum*s in habit. The roots are often thickened and tuber-like, the leaves borne in a grass-like tuft, and the flowers, which are small, blue or white, borne on long, slender racemes. The species are readily increased by division, and grow well in a greenhouse in any good soil.

Principal Species :—

corymbosa (*Chamæscilla corymbosa*), 9', sum.

CAJANUS.

A genus (*ord.* Leguminosæ) composed of a few species of tropical evergreen shrubs. *Indicus* is a native of the East Indies, but cultivated in many tropical countries for its seeds, which are very nutritious, and form a staple article of food among the natives. It is the Dhal or Dhol of India, and is considered the best of the Pulses. Propagation, by seeds; soil, rich loam.

Principal Species :—

indicus, 6' to 10', Jy., yel. — bicolor, 4', Jy., yel.

CAKILE. (SEA ROCKET.)

A hardy annual (*ord.* Cruciferae), widely distributed about the seashores of Great Britain and other countries. It is easily distinguished by its fleshy, glabrous leaves, lilac flowers, and curiously divided seed pods. It grows readily in sandy loam.

Only Species :—

maritima, 1', sum., lil.

CALADENIA.

A genus of small-growing terrestrial Orchids (*ord.* Orchidaceæ) from Australia and New Zealand. About thirty species are known. A single, Grass-

like leaf is usually produced, from within which a short flower spike bearing pretty, minute flowers arises. They are rarely seen in other than scientific establishments. Well drained pots are essential to their well-being, and a mixture of loam, peat, and sand, with a few crocks, forms a suitable compost. When growth is completed very little water must be given.

Principal Species :—

carnea.

— alba.

Patersonii.

— dilatata, Je., yel.



CALADENIA CARNEA ALBA.

CALADIUM.

Description.—Ornamental-foliaged stove plants (*ord.* Aroidæ) distinguished by handsome, often richly coloured leaves. The inflorescence is insignificant. By far the most important horticulturally is bicolor, from which many of the lovely garden forms have originated.

Propagation.—This is usually performed by division of the tubers in early spring. The pieces should be placed in small pots in a mixture of loam, leaf mould, and sand, and plunged in a brisk bottom heat, the house having a minimum temperature of 60° to 65°.

Soil.—A good compost is formed of two parts good fibrous loam, one part fibrous peat, one part leaf mould, and one part well-decayed manure; to this should be added a good quantity of coarse silver sand.

Other Cultural Points.—The tubers should be turned out of the old soil in January, and be repotted in small pots. After potting, a portion should be plunged in a close, warm, and moist house, bringing the remainder in at intervals of a few weeks until the middle of March. After growth has commenced, repotting will be necessary at frequent intervals. Where large specimens are required, half a dozen strong plants should be

Catophora (*see* *Blumenbachia*).

Cajophora (*see* *Blumenbachia*).

Calabash Tree (*see* *Crescentia*).

placed in a 10" pot; for ordinary work 6" or 8" pots will be found large enough. When a mass of shoots is made it is advisable to thin them out in order to strengthen others and ensure the production of fine leaves. Throughout the period of growth a warm, moisture-laden atmosphere is necessary, this helping the colour to develop. At all times they should be shaded from bright sun, as the leaves readily scorch. After the pots have become well filled with roots, liquid manure should be given frequently. About the end of July, when the foliage begins to decay, water may be gradually withheld until the plants are dried off, when they may be stored in a warm place until potting time, but it is perhaps worth mentioning that Caladiums generally come up strongly when planted in a border and kept moist all the year. When well grown, few indoor decorative plants are more useful. *Argyrites*, *esculentum*, and some others are used for sub-tropical bedding. Although a large number of species are known, very few are



Photo: Cassell & Company, Ltd.

CALADIUM DUKE OF YORK.

cultivated, preference being given to the more showy garden varieties. A few species are mentioned, with the colours of the leaves, followed by a selection of varieties.

Principal Species:—

<i>argyrites</i> (see <i>Humboldtii</i>).	<i>pictum</i> (see <i>bicolor</i>).
<i>bicolor</i> , 1½', grn., red.	<i>purdieanum</i> (see <i>bicolor</i>).
<i>Chantinii</i> , 1½', grn., crim.,	<i>Schomburgkii</i> , 1½', grn.,
wh. (a form of <i>bicolor</i>).	wh. (<i>syns.</i> <i>Schoelleri</i> and
<i>Humboldtii</i> , 9", grn., wh.	<i>Alocasia</i> <i>Schomburgkii</i>).
<i>marmoratum</i> , 1', grn., wh.	

Select garden varieties, 1' to 2':—

<i>albo-luteum</i> , yel., wh.,	<i>Auguste Charpentier</i> , car.,
grn.	red, gold, grn.
<i>Alexander III.</i> , red, grn.	<i>Baron Adolphe de Rothschild</i> , red, car., grn.
<i>Amarante</i> , red, vio., ro.	<i>Baronne James de Rothschild</i> , ro., red, grn.
<i>Anna de Condeixia</i> , ro.,	
grn., wh., yel.	

<i>Charlotte Hoffmann</i> , wh.	<i>Lord Penrhyn</i> , crim., car.,
<i>Crown Prince of Siam</i> ,	grn., wh.
red, pk., grn.	<i>Madame Box</i> , ro., crim.,
<i>Clio</i> , ro., wh., grn.	grn.
<i>Comtesse de Brosse</i> , ro.,	<i>Marquis of Camden</i> , red,
red, car.	grn.
<i>Duchess of Fife</i> , ro., car.,	<i>minus erubescens</i> , grn.,
wh., grn.	crim., a charming minia-
<i>Duchess of Teck</i> , wh.,	ture.
red, br.	<i>Mrs. W. E. Gladstone</i> ,
<i>Duchesse de Mortemart</i> ,	crim., grn.
wh.	<i>Oriflamme</i> , red, grn.
<i>Duke of York</i> , car., crim.	<i>Prince Sansparet</i> , red,
<i>Fastuosum</i> , red, car., ver.	grn., yel.
<i>Golden Queen</i> , gold, yel.	<i>Princess Beatrice of Bat-</i>
<i>Gurupa</i> , red, crim.	<i>tenberg</i> , bl., grn., vio.
<i>Henry Dixon</i> , grn., red.	<i>Roncador</i> , ro., grn., blk.
<i>Illustrious</i> , wh., car.	<i>Rose Laing</i> , wh., crim.
<i>John Peed</i> , red, grn.	<i>Silver Cloud</i> , wh., grn.,
<i>La Lorraine</i> , ro., car., grn.	car.
<i>Lady Dorrington</i> , grey,	<i>Souv. de Mdle. Henriot</i> ,
pk., red, wh.	red, wh., grn.

CALAMAGROSTIS.

A widely distributed genus (*ord.* Gramineæ). There are a large number of species, the majority of which are hardy, three being included in the British flora. All are readily increased by division, and succeed in good loam.

Principal Species:—

<i>lanceolata</i> , 3', Jy.	<i>stricta</i> , 2', Je.
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CALAMINTHA.

Pleasing plants, principally of perennial habit (*ord.* Labiatae), of service in borders or on rockeries. They are increased by division, cuttings, or seeds in spring, and can be grown in almost any soil. The best is *grandiflora*, a good herbaceous perennial, 1' high, flowering in June, and having purple flowers. Others are *Acinos*, the *Basil Thyme*, 6", July, annual, purple (*syn.* *Acinos vulgaris*); *alpina*, 8", July, purple; *graveolens*, 1', June, purple; and *patavina*, 6", July, red.

CALAMUS.

Description.—A tropical genus (*ord.* Palmæ) composed of a large number of elegant Palms of little decorative value except in large houses. The majority make slender climbing plants, ascending to a great height by means of stout hooked prickles on the leaves and stems. Of the stronger-growing species, stems have been found several hundred feet in length. Other species make graceful little bushes, while a few assume a tree-like appearance. In a young state they are very ornamental, and are popular for house and table decoration. The stems of several species are largely used for walking sticks and other purposes. The highly prized Malacca canes are the stems of *Scipionum*, while the stems of *Rotang* and *viminialis* are imported for chair bottoms.

Propagation.—They may be increased by means of seeds, which germinate readily, or in some cases they may be divided. Seeds should be sown in shallow pans of light soil and stood in a stove house. When the leaves are 3" long the plants must be placed in small pots, care being taken not to damage the roots. When plants are divided they should be kept close and moist until root action has recommenced.

Soil and Culture.—The general cultivation is simple. They require good loam, plenty of heat and atmospheric moisture, and abundance of

Calampelis (see *Eccremocarpus*).

moisture at the roots when growth is active. To keep the leaves of a healthy colour, liquid manure must be given when the pots are full of roots.

Principal Species :—

asperrimus.
australis.
caryotoides.
ciliaris.
erectus.

polygamus.
Regis.
tenuis.
viminalis.

Other Species :—

leptospadix.
Muelleri.
oblongus.
oxleyanus.

subangulatus.
trinervis.
volonteanus.

CALANDRINIA.

A genus (*ord.* Portulacæ) comprising a large number of species of half-hardy, annual, biennial, or perennial herbaceous plants, distinguished by succulent stems and leaves, and in many cases large, showy, red or purple flowers. The greater number of species belong to America, the remainder to Australia. The few species in cultivation are treated as annuals or biennials. Propagation is effected by means of seeds sown in well drained pots of sandy soil in early spring, the pots being stood in a warm greenhouse. When the seedlings are large enough to handle they should be thinned to five in each pot, potting all on together when necessary. By this means better plants may often be grown than when pricking off is done in the ordinary way. At all times plenty of sunlight is essential. About the end of May they may be transferred to a sunny border or rockery out of doors. Seeds may also be sown in open borders about the end of April. Plants grown in the latter manner flower as the earlier ones stop.

Principal Species :—

discolor, 1½', Jy., Aug., grh., ro.
glauca (*see* grandiflora).
grandiflora, 1', Je., Sep., st., rosy
red (*syn.* glauca).
Menziesii, 1', sum., hdy., pur.
crim.
umbellata, 6'', sum., hdy., bien.,
crim.

Other Species :—

arenaria, 6'', Jy., hdy., or.
compressa, 6'', Aug.,
hdy., ro.
nitida, 6'', sum., hdy., ro.
oppositifolia, hdy., wh.
paniculata, 1½', Jy., st., pur.

polyandra, Aug., red pur.
(*syn.* Talinum polyan-
dram).
procumbens, 6'', Aug.,
hdy., ro.

CALANTHE.

Description.—Handsome terrestrial Orchids (*ord.* Orchidacæ), found in the Malay Peninsula, Borneo, Japan, and other countries. The species are evergreen or deciduous, and characterised by large, broad, many-ribbed or plaited leaves; thick,

fleshy pseudo-bulbs; and long spikes of showy flowers, distinguished by the lip being attached to the column, and by eight thick, waxy pollen masses adhering to a separate gland. The flowers last for several weeks, either on the plant, or cut and placed in water. In most places they are considered to be amongst the easiest of Orchids to grow.

Propagation may be effected by division of the pseudo-bulbs, or by cutting them in pieces and placing them in sand, severing the sucker-like shoots as they appear, and treating them as cuttings.

Soil.—A compost of turfy loam, leaf mould, and sphagnum, with an addition of silver sand and dry



Photo: W. J. Roberts, Torquay.

CALANTHE VESTITA.

cow manure, suits them admirably. The drainage must be good, as during the growing season abundant supplies of fresh water are necessary; the evergreen section require plenty of water in winter as well.

Other Cultural Points.—Repotting should be done in February and March, the bulbs being placed singly or several together in 5'', 6'', or 7'' pots. The bulbs should be placed on the top of the soil, taking care not to bury the young shoots which are pushing from the base. No water will

be necessary until young roots begin to push into the soil. A light place near the glass in a moist stove is required during the growing season. When the pots are filled with roots, manure water must be given twice a week. When the "bulbs" have attained to full size they should be placed in a cooler, drier house. The deciduous species require little or no water after the leaves begin to turn yellow, until the flower spikes are several inches long, providing the bulbs do not show signs of shrivelling.

Principal Species and Hybrids :—

Masuca, 3', win., vio.	— nivalis, 2', spr., wh.
porphyrea, 2', spr., crim.	— oculata-gigantea, 3', win., wh.
Veitchii, 3', win., ro. (syn. <i>Limatodes rosea</i>).	— Regnierii, 2', spr., ro.
veratrifolia, 2', spr., wh.	— rubro-oculata, 2', win., wh., crim.
vestita, 2½', win., wh. (p. 152).	

Other Species and Hybrids :—

barberiana, 2', wh., yel.	Petri, 2', spr., yel. (a form of <i>veratrifolia</i>).
curculigoides, 2', Oct., or.	Sieboldii (see <i>striata</i>).
Domini, 2', Feb., lil., pur.	striata, 1', spr., yel. (syns. Sieboldii and bicolor).
furcata, 3', sum., wh.	Textori, crim., wh.

CALATHEA.

Description. — Ornamental-leaved herbaceous plants (*ord.* Scitamineæ), natives of tropical America and the West Indies. The species are numerous, and form dense masses with very short, contracted stems, from which the large, often prettily marked foliage and terminal spikes of rather insignificant flowers spring. Many of the species are often confused with the closely allied genus *Maranta*, slight botanical differences only dividing the two genera. The leaves of some species are used for basket making in South America.

Propagation is easily performed when growth is active by dividing the clumps, potting the pieces in rich light soil, and placing them in a close and warm propagating case until established.

Soil.—A light, loose compost is essential. This may be obtained by mixing two parts of peat to one part of loam and one of leaf mould, adding a good proportion of silver sand and charcoal.

Other Cultural Points.—Shallow pans one-third full of crocks are preferable to pots, and potting must be light. If the plants can be planted out on a rockery or rootery much better results will be obtained. When growth is active, abundance of water must be given, but it must always drain away quickly, *Calathea*s being very impatient of stagnant moisture. The warmest place in the stove should be given them, and they should be syringed several times a day, always keeping the surrounding stage, paths, etc., damp. They should never be subjected to very bright sunlight, as the leaves are easily scorched. Replanting or potting must be done annually.

Principal Species :—

angustifolia, 2' to 4', grn., pur.	leopardina, 2', grn.
cyclophora, 2', My., flowers wh., lvs. grn.	ornata, 1', yel., grn.
eximia, 2½', silver, grn.	— albo-lineata, 2½', grn., yel., wh.
flavescens, 1½', grn.	— regalis, 6', grn., pur.
illustris, 1', st., wh., pur.	sanderiana, 2½', olive grn., pk. stripes.

Plants growing in borders may have a top-dressing of light, rich soil annually. Liquid manure once a week in summer heightens the colour of the leaves.

Other Species :—

amabilis (see <i>Maranta amabilis</i>).	medio-picta, 1½', sum., ro., lvs. grn., wh.
bachemiana, 9'', silver, grn.	pacifica, 1', grn.
fasciata, 1', st., wh.	princeps, 2½', grn., yel.
lindeniana, 1', yel. grn., olive grn.	rufibarba, 2', grn.
makoyana (see <i>Maranta bicolor</i> var.).	veitchiana, 3', grn., yel.
	zebrina, 3', grn., pur.

CALCAREOUS SOIL.

Soil containing an abundance of chalk (carbonate of lime). Chalk or lime is absolutely essential to fertility, but the proportion may be too great. Soil that is too heavily supplied with carbonate of lime is not retentive of moisture, and the crops dry up quickly in the summer. The sun's rays are reflected so much that the soil remains unheated, and crops are consequently late. Such soils are improved by the addition of loam and animal manure.

CALCEOLARIA. (SLIPPER WORT.)

Description. — A genus (*ord.* Scrophularinæ) comprised of many distinct species, and numerous hybrids and varieties, including annual and perennial herbs, and dwarf shrubs. In gardens the chief interest in the *Calceolaria* is centred in the herbaceous varieties grown for greenhouse decoration, and the shrubby evergreen sorts employed for bedding, though some of the species are well worth growing. Chiefly increased from cuttings. (For particulars of propagation, soil, and culture, see *Florists' and Bedding Calceolarias*.)

Principal Species and Hybrids :—

Herbaceous Perennials :

amplexicaulis, 1½', hlf-hdy., sum., yel.	lobata, 9'', sum., yel. spotted.
arachnoidea, 1', sum., pur.	Pavonii, 2' to 3', sum., yel., br.
Burbidgei, 2' to 4', aut., win., spr., per., yel.	plantaginea, 1', late sum., yel.
corymbosa, 1', sum., yel., pur.	purpurea, 1', late sum., pur. There are several hybrids between this and other species.
Fothergillii, 6'', sum., yel.	

Shrubby Evergreens :—

alba, 1', sum., wh.	late sum., yel. (syn. rugosa). The parent of many hybrids.
fuchsiofolia, 1' to 2', spr., yel.	scabiosefolia, sum., yel., ev. trailing plant.
hyssopifolia, 1' to 2', sum., yel., wh.	violacea, 2', sum., vio.
integrifolia (Ruiz), 1½',	

Other Species :—

bicolor, 2' to 3', sum., yel. wh.	pinnata, 2' to 3', Jy., ann., yel.
chelidonioides, 1', Je., ann., yel.	pisacomensis, 3', Aug., yel., sub-shr., per.
flexuosa, 3', per., yel.	stricta, 3', Sep., shr., yel.
Henrici, 2', shr., yel.	tenella, 6'', hdy. per., yel., or. red.
kellyana, shr., or. red; a curious hybrid.	thyrsiflora, 1½', Je., shr., yel.
petiolaris, 1½', aut., bien. or per., yel. (syn. <i>conata</i>).	

Florists' or Herbaceous Calceolarias.—Since cultivators and cross-breeders took up the improvement of the herbaceous greenhouse *Calceolaria* great strides have been made, till at the present time there are numerous strains and varieties which are nearly perfect in the size, form, and colour of the flowers, the plants also being of dwarf, compact habit.

Propagation.—From seeds sown in July and August. *Calceolaria* seed is very fine, and requires

much care in sowing. Fill a shallow pan three parts full of soil, and press the latter down evenly. Scatter a little silver sand on the surface, and give a watering through a fine rose. Leave the pan for an hour before sowing, so that the water can drain away. Sow the seed thinly, and cover with the lightest possible sprinkling of silver sand. Cover the receptacle with a square of glass, and place it in a cold frame. Shade closely till the seedlings appear, and then gradually expose them to the light. At this stage the soil must be kept in an even state of moisture.

sprinkling of water, and place them near the glass in a cold frame. Shade carefully at first, and keep the soil moist. When the plants are growing freely, more air may be given, and less shade. As soon as the roots begin to feel the sides of the pots shift the plants into 5" pots. Be careful not to break the balls, press the compost moderately firmly, continue to grow the plants close to the light in a cold pit or frame, shade from hot sunshine, water with care, and allow ventilation night and day. As soon as roots commence to appear at the drainage hole the plants are ready for their flower-



A GOOD TYPE OF HERBACEOUS CALCEOLARIA.

Soil.—For seeds, one part loam, one part leaf mould, half a part silver sand. For seedlings at the first potting, two parts loam, one part leaf mould, and half a part sand. For the final potting, two parts turfy loam, half a part leaf mould, half a part thoroughly decayed manure, and small lumps of charcoal or old mortar, with enough sand to keep the compost open.

Other Cultural Points.—The main thing with Calceolarias is to avoid any checks, not allowing the plants to become dry, starved, or potbound, from the seedling to the final stage. As soon as the seedlings are large enough to handle, prick them into thumb pots or pans, give a slight

ing pots, which may be 7" or 8". After the final shift, stand each plant on an inverted pot placed on a bed of coal ashes, and allow room between for a thorough circulation of air. When frost appears in the autumn, remove the plants to positions near the glass in a light house, having a temperature not above 50°, and keep the atmosphere moist. Never coddle the plants. Give liquid manure once a week when the pots are full of roots. Support the flower stems with neat stakes, but do not cramp the natural habit of the plants.

Enemies.—*Aphides*.—Green Fly is the bane of the greenhouse Calceolaria, and the aim of the grower should be to prevent attacks. This is done

by growing the plants in a cool, moist temperature. A refreshing dew on the surface of the leaves in the morning, while in the frame, wards off insect pests and invigorates the plants. Watch for the first traces of Aphis, and fumigate slightly.

Varieties.—The finest flowers are continually being crossed by raisers, with the result that the best strains of mixed seed may be relied on to produce flowers of wonderful brilliancy and diversity of colour.

Shrubby or Bedding Calceolaria.—A few species and a number of varieties and hybrids of the shrubby Calceolaria are largely employed for summer bedding. At one time masses of crimson and rich brown flowers were to be seen, but now the golden yellow Calceolaria is the most popular.

Propagation.—Hybrids and varieties of rugosa are raised from seeds, which produce plants of a wide range of colour. The best method of propagating bedding Calceolarias is from cuttings in the autumn. Early in October prepare a bed of sandy soil in a cold frame, with a thin layer of sand on the surface. Select young, growing shoots, remove the lower leaves from them, and cut horizontally just below a joint. Dibble them in regularly and firmly, sprinkle with water through a rose to settle the soil and prevent flagging, and keep the frame close and shaded for a few days. The cuttings take a long time to root, but if air is provided on favourable occasions, and protection given in the case of severe frost, they will pass the winter safely, and commence growth in the spring.

Soil.—A deep, loamy soil is necessary for Calceolarias if they are to flower well throughout the season. They often die off in hot, sandy soils.

Other Cultural Points.—At no time do the plants require artificial heat. When growth commences in the spring pinch out the points of the shoots to encourage a branching habit. It is a great mistake to leave Calceolarias in the cutting frame till more tender plants are bedded out in May or June. The end of April is the best time for planting, but if it cannot be done then the plants should be transferred to temporary beds, made up of sandy loam and leaf mould, and left there until they are removed to their flowering quarters. Continual blooming is encouraged by pinching off the old flower stems.

Diseases.—Calceolarias are often disappointing owing to their habit of dying off in the summer, through a disease which causes the roots to decay. There appears to be no direct cure, but the trouble is most prevalent amongst plants growing in hot, shallow soils. Early planting is the best preventive, because the plants become firmly established before hot weather sets in.

Select Varieties:—

aurea floribunda, 1', yel.; fine.	Golden Gem, 1½', deep yel.; one of the best.
Bijou, 1', dark red; free.	Prince of Orange, 1', or., br.; compact.
Gaines's Yellow, 1', yel.; good bedder.	Sultan, 1'; fine dark var.

Species and Hybrids:—

Few of the pure species are used for bedding, but amplexicaulis is useful for large beds and borders. It blooms late, and is about 1½' high; its lemon coloured flowers are very effective. The hybrids of rugosa are of strong constitution, and produce flowers of varied colours.

Calcearia (see *Corysanthes*).

CALDCLUVIA.

The one species of this genus (*ord.* Saxifragæ) is a Chilean evergreen tree, requiring the protection of a greenhouse, and may be propagated from cuttings of half-ripe shoots inserted in sandy soil in a warm, close case. Peat and loam form a suitable compost.

Only Species:—

paniculata, 20', Je., wh.

CALEA.

A genus of herbs and sub-shrubs (*ord.* Compositæ) largely distributed throughout tropical America. The simple leaves have usually three very distinct nerves and a rough surface.

Principal Species:—

jamaicensis, 3', Je., pur. urticæfolia, 2', Jy., yel.
pinnatifida, Je., yel.

CALEANA.

A small terrestrial plant (*ord.* Orchidaceæ) from Australia, requiring greenhouse cultivation. The flower is remarkable by reason of the irritability of the lip. In fine weather it bends back, exposing the column; in wet weather, or when disturbed, it closes up to protect the column. The plants are cultivated in well drained pots in a compost of fibrous peat and loam, with a little sandstone and charcoal added.

Principal Species:—

major, Je., grn., br. minor, Je., grn., br.

CALECTASIA.

A pretty Rush-like genus (*ord.* Juncaceæ) from Australia, with a sub-shrubby habit and elegant, needle-shaped leaves sheathing the stem at the base, and solitary, star-shaped, terminal flowers. The stock can be increased by division, and a mixture of sandy peat and loam makes a suitable compost. Greenhouse cultivation is necessary.

Only Species:—

cyanea, 1', Je., bl.

CALENDULA. (MARIGOLD.)

Effective plants (*ord.* Compositæ) for the garden or greenhouse. The majority are annuals, but there are a few of shrubby habit which must be grown in the greenhouse. The latter should be cultivated in loam and leaf soil or peat; the others will grow in any good soil. The hardy annuals can be sown in spring and treated as ordinary hardy annuals; the tender ones should be sown in slight heat. The shrubby species are propagated by cuttings in heat in spring. The best known is officinalis, the common pot Marigold, of which the varieties Meteor, Orange King, and Yellow Queen, all with yellow flowers, are improvements. Others are arvensis, 2', June, yellow; maderensis, 2', July, hardy annual, orange; ægyptiaca (*syn.* sicula), 1', June, hardy annual, yellow; and suffruticosa, 1', November, greenhouse shrub, yellow. (See also MARIGOLDS.)

CALIMERIS.

Hardy perennial plants (*ord.* Compositæ) now included with the Asters, and requiring the same treatment. That known as incisa (*syn.* Aster incisus), which is about 3' high, flowers in July,

Caldasia heterophylla (see *Bonplandia geminiflora*.)

Calico Bush (see *Kalmia latifolia*).

and has flowers ranging from white to pale purple, is one of the best.

CALIPHURRIA.

Pretty half-hardy or greenhouse bulbous plants (*ord.* Amaryllideæ), with white flowers and broad, rather plaited, leaves. They are propagated by offsets, or by seeds sown when ripe in heat. They should be grown in loam, leaf soil, or peat, and a little sand. The best is *hartwegiana*, 1', June. *Subedentata* is now included with *Eucharis*.

CALLA.

The best of the plants grown in gardens as *Callas* will be found under *Richardia* (*see also* ARUM LILIES). The ornamental aquatic, *palustris* (*ord.* Aroidæ), with small, *Richardia*-like flowers, is hardy, and is adapted for the margins of lakes and ponds. It has white flowers, and blooms in summer and autumn. Increased by division and seeds.

CALLIANDRA.

A large genus of shrubs (*ord.* Leguminosæ) found in tropical America, of dense habit. They are propagated by means of cuttings, inserted in sandy soil, and placed in a warm, close case. A compost of two parts sandy peat to one part loam meets their requirements. Potting should be done firmly. A stove or intermediate house temperature is necessary, and watering, especially in winter, needs careful attention.

Principal Species :—

caracasana, 3', Ap., red. *hæmatocephala*, 3', sum., red.
fulgens, 2½', sum., red. *Tweedii*, 3', My., red.

Other Species :—

brevipes, 4', sum., pk. *Harrisii*, 15', sum., ro.

CALLIANTHEMUM.

Low-growing Alpine herbs (*ord.* Ranunculaceæ), almost devoid of stem, and having thick, fleshy rhizomes. They are hardy, and answer to the same methods of propagation and treatment generally as *Anemones*. Five of the members of the genus were formerly regarded as species, but they are now looked upon as forms of one. The variety *rutæfolium anemonoides*, March, white or pale rose, is the most notable of all.

CALLICARPA.

A genus of stove or greenhouse shrubs (*ord.* Verbenaceæ). They usually have hairy leaves, minute flowers, and small, highly ornamental fruits produced in clusters from every leaf axil on long arching shoots. Cuttings of soft shoots root readily in spring. When rooted they should be potted into 3" pots, using a mixture of two parts loam, one part leaf mould, and enough coarse sand to ensure the whole being kept sweet. They should be stood in a temperature of from 55° to 60°, and pinched several times to form a good foundation. When the pots are well filled with roots a shift into 6" pots should be given. Stopping must be finished by the middle of July, and long shoots encouraged. As soon as flowers are produced, a light, airy house must be provided. The fruit sets freely, and should be well coloured by the middle of September. It lasts in good condition for several months. The various species are found in South America, India, and Japan.

Principal Species :—

lanata, 3', st., berries pur. *purpurea*, 6', st., berries pur.

Calinea (*see Doliocarpus*).

Other Species :—

americana, 6', grh., berries pur. *japonica*, 3', grh., berries pur.
cana, 3', st., pur. (*syn.* *mollis*, 3', berries pur.
tomentosa). *rubella*, 2', hlf.-hdy., berries red.

CALLICOMA.

A New Holland genus (*ord.* Saxifrageæ), of which one species, *serratifolia*, is in cultivation. It forms a dense shrub 4' in height, bearing coarsely toothed leaves, whitish on the under side, and small heads of yellow flowers in late spring. It roots readily from cuttings, and grows well if potted firmly in sandy peat in an ordinary greenhouse.

Principal Species :—

serratifolia, 4', My. to Aug., yel.

CALLIGONUM.

A group of hardy shrubs found growing in poor, sandy soil in West Africa and West Asia (*ord.* Polygonaceæ). About twenty species are known. They make dense bushes with small, simple alternate evergreen or deciduous leaves, and bear small, often whitish flowers in small clusters. The genus is of little horticultural value. May be grown in any ordinary soil.

Principal Species :—

Pallasia, 3' to 4', My., grn., wh.

CALLIOPSIS (*see* COREOPSIS).

CALLIPSYCHE.

Beautiful and interesting bulbous plants (*ord.* Amaryllideæ), with numerous flowers of some shade of yellow, and notable for the great length of their stamens. The leaves make their appearance after the flowers are past. Propagation is effected by offsets and seeds, much in the same way as in *Eucharis* or *Pancratium*. The bulbs should be potted firmly in a compost of good fibrous loam, two-thirds; leaf mould, one-third; and plenty of sand. An intermediate house with shade in summer meets their requirements.

Principal Species :—

aurantiaca, 2', Feb., or. *mirabilis*, 3', Jy., greenish
eucrosioides, 2½', Mch., yel.
greenish yel. (*syn.* *mexicana*).

CALLIRHOË.

Ornamental annuals or perennials (*ord.* Malvaceæ), of much beauty in beds, borders, or rockwork. They grow well in light, sandy loam, and are propagated by seeds, the perennials by cuttings also. The seeds are better sown under glass in a frame. The best perennial species is *involucrata*, 6", July, crimson, a pretty trailer. The best annual species is probably *pedata*, 2', August, purple crimson. Others are *alcaëoides*, 1', July, white to purple (*syns.* *C. macrorrhiza* and *Sida alcaëoides*); *lineariloba*, 6", July, lilac; and *involucrata*, 6", July, cherry red, tinted purple.

CALLISIA.

Stove plants with the habit of the trailing *Tradescantias* (*ord.* Commelinaceæ), to which they are closely allied. They are of the easiest propa-

Callichroa (*see Layia*).

Calliprora (*see Brodiaea*).

Callipteris (*see Asplenium*).

gation by cuttings in sandy soil in heat. Loam with a little peat and sand will answer for compost.

Principal Species :—

martensiana, 1', sum., repens, 6'', Je., bl. wh. (*syn.* *Tradescantia martensiana*).

CALLISTACHYS.

A name given to a small section of *Oxylobium* (*ord.* *Leguminosæ*), and differing from the type chiefly by having the pods divided by partitions between the seeds, though the character is inconstant. They are small shrubs with simple leaves and yellow or red and purple flowers. Now referred to *Oxylobium*.

Principal Species :—

cuneifolia (*see* *Isotropis* *linariæfolia* and *lineare striata*). (*see* *Oxylobium lineare*).
lanceolata, *longifolia*, *ovata*, and *retusa* (*see* *Oxylobium Callistachys*).

CALLISTEMON. (BOTTLE BRUSH TREE.)

About a dozen species of tall shrubs or small trees (*ord.* *Myrtacæ*). The flowers are in dense spikes. They are notable for the long, yellow or scarlet stamens, which give them the appearance of a bottle brush. The leaves are simple, evergreen, and leathery. Propagated by seeds sown in a warm pit or stove, and treated like *Grevillea robusta* in their earliest stages. Cuttings of shoots just getting firm root in pots of very sandy peat under a hand-light in early summer. Equal parts of fibrous loam and peat, with a good dash of sand, will make a suitable compost. Some cultivators add lumps of charcoal. Make the soil firm whether in pots or tubs, water liberally in summer, but keep them fairly dry in winter in a warm greenhouse; those which flower early might have a temperature of 50° in spring.

Principal Species :—

lanceolatus, 10', Je., crim. — *albus*, wh.
(*syns.* *scaber*, *marginatus*, *semperflorens*, — *viridiflorus*, 6', Je., Aug., grn., yel. (*syn.* *Metrosideros citrina* and *M. semperflorens*). *Metrosideros viridiflora*).
rigidus, 5', Ap., cream *speciosus*, 10', Ap., crim. (*syns.* *glaucus* and *Metrosideros speciosa*). (*syn.* *viminalis*).
rugulosus (*see* *rigidus*).
salignus, 6', Je., straw (*syns.* *lophanthus* and *Metrosideros lophantha*).

Other Species :—

brachyandrus, 3', Oct., yel. *phœniceus*, 3', Mch., pur.
linearis, 6', Je., sc. *pinifolius*, 6', Je., grn.
microphyllus, 5'. *pungens*, 6', My.

CALLISTEPHUS.

Half-hardy annuals (*ord.* *Compositæ*), the chief interest of which lies in the numerous garden varieties, the latter being superior to the species. For culture and varieties *see* *ASTER* ("CHINA").

Species and Varieties :—

hortensis, 1½', Jy., bl. — *multiplex*, 1½', Jy., (*syn.* *chinensis*). variegated.
— *albus*, 1½', Jy., wh. — *ruber*, 1½', Jy., red.
— *brachyanthus*, 1½', Jy., bl. — *variegatus*, 1½', Jy., variegated.

Callistemma (*see* *Callistephus*).

CALLITRIS.

A genus of Coniferous trees (*ord.* *Coniferae*) allied to *Thuya* and *Cupressus*. They may be propagated by seeds, or by cuttings of the half mature shoots in pots of sandy soil, kept in frames from which frost is just excluded in winter. Sandy, fibrous loam will suit them. They may be grown in a cool greenhouse, intermediate house, or stove with equal freedom, and are often grown as fine foliage plants on account of their elegance.

Principal Species :—

cupressiformis (*see* *rhomboides*). *rhomboides*, 20', grh. (*syn.* *Frenela rhomboides*).
quadrivalvis, 20', Sep., grh., grn. (*syn.* *Tetraclinis articulata*).
triquetra, Ap., grh., grn.



Photo: Cassell & Company, Ltd.

CALOCHORTUS NITIDUS (*see* p. 159).

CALLIXENE.

A half-hardy shrub allied to *Lapageria* (*ord.* *Liliacæ*), of dwarf, erect habit, only 18" high when grown in sheltered places out of doors. It has short, spreading side shoots, small evergreen leaves, and small white flowers. Propagation may be effected by taking off rooted suckers. Peaty soil suits, such as is used for *Lapageria*. Now referred to *Luzuriaga*.

Principal Species :—

polyphylla (*see* *Luzuriaga erecta*).

Callithauma (*see* *Stenomesson*).

CALLUNA. (LING. HEATHER.)

A beautiful little hardy shrub, so well known as to need no description. It prefers a peaty soil, but can be grown in ordinary garden soil. The type, *vulgaris*, is surpassed in beauty by the varieties; the white forms being favourites. *Hammondi* and *Serlei* are the best of these. *Alportii* and *carnea* are good coloured varieties; *Foxii* and *pygmæa* are



Photo : Cassell & Company, Ltd.

CALOCHORTUS LUTEUS (see p. 159).

valued for their dwarf habit; *flore-pleno* for its double flowers; and *argentea*, *aurea*, and *cuprea* for the colour of their foliage. All are propagated by cuttings. *Calluna* is generally catalogued by nurserymen with *Erica*.

CALLUS.

This name is applied to a corky swelling or outgrowth from the base of cuttings after they have been inserted in soil for some time. If a *Pelargonium* cutting is examined after it has begun to callus, the cushion of tissue will be found to arise at the junction of the bark and the wood; in other words, it arises from the cambium layer, and is a sign that the cutting is going to form roots. The latter arise from the inner side of the cambium layer, and push or pierce their way through the callus. The same process may be seen where branches have been cut off trees, the callus being the method of covering or healing the wound.

CALOCHILUS.

Terrestrial Orchids (*ord.* Orchidacæ), whose chief beauty resides in the lip, which is densely fringed on the upper surface. The rootstock is

tuberous. Increase is obtained by removing the offsets, or by dividing the clumps of tubers. Fibrous loam and turfy peat, with sand, will suit them. They require a greenhouse temperature, with an increase of heat when about to bloom, and again when making their growth, at which time plenty of water should be given.

Principal Species :—

campestris, 9", Ap., Je., *paludosus*, 9", My., grh.,
grh., grn., br. (*syn.* br.
herbaceous).

CALOCHORTUS. (MARIPOSA LILY.)

Description.—Exquisitely beautiful bulbous plants (*ord.* Liliacæ) of great value for the garden, or for frame cultivation. Many of the flowers are beautifully marked, and it may be safely said that all are worthy of cultivation.

Propagation.—By seeds sown in pans, and the plants grown in a cool house, planting out the seedlings the third year. Also by offsets, removed when the parent plants are at rest, and by the small bulbs some produce on the stem.

Soil.—A light, peaty soil, well drained, will suit the *Calochorti*, but it is preferable to make up a compost of sand, leaf soil, and road grit.

Other Cultural Points.—Plant from the middle of September to the end of November, 3" deep, and the same distance apart, in raised beds of the soil



Photo : Cassell & Company, Ltd.

CALOCHORTUS CLAVATUS (see p. 159).

recommended above. A sunny place should generally be chosen, where the plants can be shaded when in bloom. Cover the surface with Bracken,

Aster stems, or similar material, which ought to remain until February or March. They must not suffer from dry weather while in growth. Frame culture is certainly the best in most gardens. The bulbs may be planted as recommended for open-air cultivation, and when the plants begin to grow they must have plenty of air. Calochorti planted in pots should be kept in a cold frame until they show flower, always giving them a sufficiency of air.

Principal Species :—

albus, 1', Jy., wh. A charming plant with eight to twelve drooping wh. flowers (*syn.* *Cyclobothra alba*).

caeruleus, 6", Jy., lil., bl. Several vars. can be had; major and roseus are good.



Photo: Cassell & Company, Ltd.

CALOCHORTUS LUTEUS CITRINUS

(*syn.* *venustus citrinus*).

luteus, 1', Jy., yel. (*see* p. 158). One of the prettiest. The vars. *citrinus* (*syn.* *venustus citrinus*, *see* figure) and *concolor* are very fine.

pulchellus, 1', Jy., yel. A handsome species, harder than many; flowers drooping (*syn.* *Cyclobothra pulchella*).

Purdyi, 1', Jy., wh. A splendid doer in places where many others will not thrive.

splendens, 2', Jy., lil. Fine forms are *atroviolaceus* and *rubrum*.

venustus, 1½', Jy., wh. Perhaps the most useful and vigorous of the species. There are a number of vars., and all are good. The Eldorado strain is the best.

Other Species :—

ameus, 1', Jy., pk. (*syn.* *Cyclobothra amea*).

apiculatus, 1', Jy., yel.

Benthamii, 8", Jy., yel. (*syn.* *elegans lutea*).

bonplandianus, 2½', Jy., pur. (*syns.* *purpureus* and *Cyclobothra purpurea*).

clavatus, 2½', Jy., yel. (*see* p. 158).

elegans, 9", Je., wh.

flavus, 2', Jy., yel. (*syns.* *pallidus* and *Cyclobothra barbata lutea*).

Greenii, 1', Je., lil.

Gunnisonii, 2', Jy., wh.

Howellii, 1½', Jy., wh.

Kennedyi, 2½', Jy., or. red.

lilacinus, 9", Jy., lil. (*syns.* *uniflorus* of Hooker and *umbellatus*).

longebarbatus, 1', Jy., pur.

Lyonii, 2', Je., wh., etc.

macrocarpus, 1½', Aug., pur.

madrensis, 9", Aug., or. yel.

maweanus, 9", Jy., pur. (*syn.* *elegans* of *Botanical Magazine* 5976).

nitidus, 2', Aug., wh. (*see* p. 157).

Nuttallii, 6", Je., wh. (*syn.* *Leichtlinii*).

obispoensis, 1½', Aug., yel., pur., etc.

Palmeri, 1½', Jy., wh.

Plummera, 2', Jy., lil.

Tolmiei, 2', Jy., lil.

uniflorus, 6', Jy., lil.

Weedii, 1', Jy., yel. (*syn.* *citrinus*).

CALODENDRON.

A tall tree with spreading branches in twos or threes (*ord.* *Rutaceae*); large, oblong leaves, and handsome, branched panicles of pink flowers. Propagation is effected by cuttings of half-ripe wood in a propagating case or in pots of soil plunged in bottom heat and covered with a bell-glass. The large seeds are also used, but the trees are longer in coming into bloom. Sandy loam will suit the tree, whether grown in pots in the greenhouse or planted out in the cool conservatory with plenty of head room.

Only Species :—

capensis, 10' to 50', Je., Jy., grh., pk.

CALOPHACA.

Pretty, hardy shrubs, with yellow, Pea-shaped flowers (*ord.* *Leguminosae*), of deciduous habit. They grow in any good soil, and are propagated by seeds or by grafting on the Laburnum or allied species. The species in general cultivation is *wolgarica*, 3', June, yellow.

CALOPHANES.

Perennial herbaceous or shrubby plants (*ord.* *Acanthaceae*), for border or greenhouse cultivation. They are propagated by seeds, sown in spring, or by division in spring or autumn. Almost the only species at present in cultivation is *oblongifolius*, which is a hardy border plant, growing from 6" to 15" high, with rather downy leaves, and blue or purplish flowers in August. It likes a dry, sandy soil.

CALOPHYLLUM.

A genus of stove trees allied to the Mammee Apple (*ord.* *Guttiferae*) and characterised by having finely feather-nerved, leathery, dark green leaves. Increase is secured by cuttings of fairly firm shoots in a propagating case. Use fibrous loam, a third of peat, and plenty of sand.

Principal Species :—

Calaba, 30', st., wh. *inophyllum*, 90', st., wh. Calaba tree. Pinnay tree.

Tacamahaca, 30', st., wh.

Calodracon (*see* *Cordylina*).

Calonyction (*see* *Ipomaea*).

Calopetalon (*see* *Marianthus*).

CALOPOGON.

Dwarf, terrestrial Orchids (*ord.* Orchidaceæ), bearing one or two grassy leaves on the stem, which terminates in a lax raceme of fairly large flowers of some shade of purple, adorned with a yellow beard on the lip. Increase is obtained by division of the clumps of small tubers. They may be grown in pots in peat and loam, with sand, and, though nearly hardy, do best with greenhouse treatment.

Principal Species :—

multiflorus, 1', grh., pulchellus, 1½', Jy., pur.
amethyst, pur. (*syn.* Limodorum tuber-
osum).

CALOSANTHUS.

A tree (*ord.* Bignoniaceæ) classified by some under Bignonia, and by others under Oroxylum. Flowers large, foetid, white, striped purple, and arranged in a long terminal raceme. It is propagated by half-ripened cuttings in a propagating case, or in pots plunged in heat and covered by a bell-glass. Loam and a little peat, with sand, will suit it.

Principal Species :—

indica, 40', st., pur.

CALOSTEMMA.

Greenhouse bulbous plants allied to Eurycles (*ord.* Amaryllidæ). The flowers vary from white to yellow and purple. They are propagated by offsets; and succeed in fibrous loam, with plenty of sand. Cool greenhouse treatment will meet their requirements.

Principal Species :—

album, 1', My., wh. purpureum, 1', Nov., dark
Cunninghamii (*syn.* Eury- pur.
cles Cunninghamii). — carneum, 1', Nov., pale
luteum, 1', Nov., yel. pur. or wh. (*syn.* car-
neum).

CALOTHAMNUS.

A genus of about twenty-two species of greenhouse shrubs (*ord.* Myrtaceæ), of a strong-growing character, with leathery, evergreen leaves. The flowers are showy and disposed in spikes, often one-sided, while the stamens are of a beautiful red or scarlet colour. They are propagated by cuttings of young wood just getting hard at the base, in peat and sand under a bell-glass. Sound loam and peat in equal proportions, with a good dash of sand, make a suitable compost.

Principal Species :—

gracilis, 3', Jy., sc. quadrifidus, 3', Jy., sc.
lateralis, 3', Jy., Sep., sc. villosus, 3', Jy., sc.
(*syn.* longifolius).

CALOTIS.

Perennial, rarely annual, herbs, allied to Brachycome and Bellium (*ord.* Compositæ), and tufted or branched. The flower heads are small, with white, blue, or violet rays. Propagation is effected by seeds and by division. Fibrous loam, a little leaf mould, and plenty of sand, make a good compost. Greenhouse treatment is necessary.

Principal Species :—

cuneifolia, 1', Je., bl.

CALOTROPIS.

A genus of about three species of shrubs or small trees (*ord.* Asclepiadæ), with opposite leaves and

milky juice. The flowers are large, greenish white externally, and purplish internally. Propagation is effected by seeds in heat; also by cuttings of half-ripened wood in sand under a bell-glass or in a case. For soil use fibrous loam, a little leaf soil, and plenty of sand. Stove heat is required.

Principal Species :—

gigantea, 6' to 15', Aug., procera, 6', Jy., wh.
10., pur.

CALPURNIA.

Greenhouse trees or shrubs (*ord.* Leguminosæ), with the flowers and habit of a Laburnum. Propagation is effected by taking short side shoots in summer as they are getting firm at the base. For soil, use good loam with a third of peat and some sand. Drain the pots or tubs well.

Principal Species :—

aurea, 15', grh., gold yel.; Natal Laburnum.

CALTHA.

Generally effective, hardy perennials (*ord.* Ranunculaceæ), of much value in marshy places, and by the sides of streams and ponds. Propagated by seeds, sown in spring, or by division of the roots at that season or in autumn. Any common soil will do; though palustris is more vigorous in that which is of a heavy nature.

Principal Species and Varieties :—

leptosepala, 1', My., yel. The plant sometimes known by this name, or as biflora, has wh. flowers, and is the var. bicolor of palustris.

palustris, 1', Ap., yel. There are several handsome vars. of this native plant, the best being bicolor, wh., monstrosa flore pleno, and nana flore pleno. Alpina, arctica, and asarifolia are botanically forms of palustris also, but are kept distinct for garden purposes.

Other Species :—

alpina, 1½', My., yel. asarifolia, 6'', My., yel.
arctica, 1', My., yel. polypetala, 1', My., yel.

CALYCANTHUS. (ALLSPICE.)

Desirable,* sweet-scented shrubs (*ord.* Calycanthaceæ), generally hardy in our climate, and producing rather dull coloured but deliciously fragrant flowers, and oval or longish oval sweet-scented leaves. Usually propagated by layers in summer, but also by seeds sown in a cold frame, either when ripe or in spring. They prefer soil of a peaty nature, but can be grown in any good garden soil. The Allspices are very useful for the garden or for the shrubbery, and it is desirable that they should be screened from cold winds.

Principal Species and Varieties :—

floridus, 6', Je., br., pur. A favourite because of its scent. There are several vars., asplenifolius, ovatus, and variegatus being the best.

glaucus, 6', My., br., pur. (*syn.* fertilis). There are several forms, including lævigatus, oblongifolius, pennsylvanicus, etc.

occidentalis, 9', Aug., red. A fine species, with very fragrant flowers (*syn.* macrophyllus). præcox (*see* Chimnanthus fragrans).

Calpicarpum (*see* *Kopsia*).

Caltropis (*see* *Tribulus*).

Caltropis, *Water* (*see* *Trapa*).

Calumba, false (*see* *Coscinium fenestratum*).

Calumba root (*see* *Jateorrhiza Calumba*).

Calumba wood (*see* *Coscinium fenestratum*).

Caloscordum (*see* *Nothoscordum*).

CALYCOPHYLLUM.

Evergreen stove trees (*ord.* Rubiaceæ), allied to *Bouvardia* and *Manettia*, with small, white flowers. They are propagated by cuttings of half-ripened wood in a propagating case, or frame, in a warm pit. Use loam and peat in equal proportions, with sufficient sand to make the compost porous.

Principal Species :—

candidissimum, 20' or more, wh.

CALYPSO.

A pretty terrestrial Orchid (*ord.* Orchidaceæ), of which the only species, named *borealis*, is hardy, with a little protection in the shape of litter or Cocoanut fibre refuse over it in the winter. The flowers are produced singly on the stalk, and are rose, brown, and yellow in colour. It grows about 5" high, and likes a half-shaded place in an artificial bog, or low nooks of a rock garden. It is propagated by offsets when the plant is at rest.

CALYPTRANTHES.

A large genus of trees or shrubs allied to *Pimenta* (*ord.* Myrtaceæ), with small, axillary or subterminal flowers, and evergreen foliage. Propagation is effected by layers, or by cuttings of half-ripened wood in sand under a bell-glass, or in a propagating case. Use fibrous loam and peat, with a good dash of sand; and give stove treatment.

Principal Species :—

caryophyllifolia (see *Eugenia jambolana*). *jambolana* (see *Eugenia jambolana*).
Chytraculia, 12', Ap., wh. *Syzygium*, 20', Je., wh.

CALYPTROCALYX.

Stove Palms (*ord.* Palmæ). The leaves terminate abruptly like those of a *Geonoma*. Propagated by imported seeds. Use fibrous but substantial loam, with a little peat and sand for soil. Feed well rather than over-pot them.

Principal Species :—

spicatus, 12'.

CALYPTROGYNE.

A small genus of Palms (*ord.* Palmæ) requiring stove treatment. Increase is secured by seeds. For compost use substantial yellow loam, with a little peat and sand. Drain well and avoid over-potting.

Principal Species :—

ghiesbreghtiana, 2' to 5' *spicigera*, 5'.
(*syns.* *Geonoma ghiesbreghtiana*, *magnifica* *Swartzii*, 50' (*syn.* *Calyptronoma Swartzii*).
and *Verschaffeltii*).

CALYSTEGIA. (BEARBIND or BINDWEED.)

Hardy twining or trailing herbaceous plants (*ord.* Convolvulaceæ) close to *Convolvulus*, and ornamental for covering trellis-work or hedges, although aggressive in their habit of creeping at the roots. Propagated by division of the plants in spring, or by seeds sown in the open or under glass at that time. Any common garden soil. On account of the running habit of the roots of the

Calystegias, it is necessary to be careful not to plant them where they can encroach on other flowers.

Principal Species :—

hederacea, 6', Je., etc., ro. A pretty form with double flowers, and among the most useful of the genus (*syn.* *pubescens*).

Sepium dahurica, 6', Jy., ro. pur. A beautiful species with handsome flowers.

Other Species :—

catesbeiana, 5', Jy., ro. *silvatica*, 6', Jy., wh. (*syn.* *marginata*, 3', Jy., hlf-hdy., pk. *Convolvulussylvaticus*).

Sepium, 6', Jy., wh. (*syn.* *inflata*). Common Bind-weed. *Soldanella*, 3', Je., red (*syn.* *Convolvulus Soldanella*).

— *incarnata*, ro. *spithamea*, 1', Jy., wh. (*syn.* *tomentosa*).

CALYTHRIX.

A genus of Heath-like shrubs (*ord.* Myrtaceæ) with small, three or four faced, rigid, evergreen leaves having the fragrance of a Myrtle. Propagation is accomplished by cuttings of short side shoots in sand under a hand-light or bell-glass. Loam, peat, and a dash of sand will answer for compost. Greenhouse treatment is necessary.

Principal Species :—

angulata, 3', Ap., Je., yel. *sapphirina*, 2', Ap., Je., bl. *aurea*, 2', Ap., Je., bright *scabra* (see *tetragona*).

yel. *tetragona*, 4', Ap. to Aug., wh. (*syns.* *brunioides*, *ericoides*, *glabra*, *pubescens*, *scabra*, and *virgata*).

breviseta, 3', My., Jy., pale lil. *glutinosus*, 3', Ap., Je., yel., pur.

ericoides (see *tetragona*). *pubescens* (see *tetragona*).
glabra (see *tetragona*).
virgata (see *tetragona*).

CAMARIDIUM.

A small genus of Orchids (*ord.* Orchidaceæ) requiring stove heat. They have leafy stems, sometimes branched, frequently form pseudo-bulbs, and have solitary white flowers of medium size in the axils of the leaves. Propagation is effected by division of the plants. Soil, fibrous peat, sphagnum, and broken crocks. Raise the plants well above the surface of the baskets or Orchid pans.

Principal Species :—

album, 1, Nov., wh. (*syn.* *lawrenceanum*, yel., wh., spotted pur. *Ornithidium album*).
ochroleucum, 1', Jy., wh.

CAMASSIA. (QUAMASH.)

Ornamental, hardy, bulbous plants (*ord.* Liliaceæ) with spikes of pretty flowers. They are adapted for the border. They are propagated by offsets taken off after the leaves die down, or by seeds sown in pots under glass or in the open. The principal species is *esculenta*, 2', July, blue. Other forms are *Cusickii*, 2½', July, pale blue; *Engelmannii*, 1½', July, blue; and *Fraseri*, 2', June, blue (*syn.* *Scilla esculenta*).

CAMBESSEDESIA.

Small stove shrubs (*ord.* Melastomaceæ) with rose or purple flowers. Propagation is readily accomplished by means of cuttings of the side shoots which are getting firm at the base, inserted in sand under a bell-glass. Loam and peat in equal parts, with some silver sand, will suit them.

Principal Species :—

paraguayensis, 1' to 1½', Jy., rosy red.

(*Amarotis* (see *Sarcocilus*).

Calycotrix (see *Calythrix*).
Calymenia (see *Oxybaphus*).
Calymmodon (see *Polypodium*).
Calyptraria (see *Centronia*).
Calyptrion (see *Corynostylis*).
Calyptronoma (see *Calypstrogyne*).

CAMELINA.

A small genus of annuals (*ord.* Cruciferae). The best known species is *sativa*, which is of no horticultural value, but more or less grown for the sake of its seeds for feeding poultry, making

son. Few greenhouse shrubs are more accommodating than Camellias. They are useful for pot and tub culture, training on back walls of glass structures, and planting in beds in large conservatories. The flowers, which are pro-



Photo: Cassell & Company, Ltd.

THE OLD DOUBLE WHITE CAMELLIA; ALBA PLENA.

oil-cake, and for the expression of soapmakers' oil.

Principal Species:—

sativa, 2' to 3', Je., Jy., hdy., yel.

CAMELLIA.

Description.—Evergreen, flowering shrubs (*ord.* Ternstroemiaceae) composed of several species and a large number of varieties. Though chiefly grown under glass, some are hardy in sheltered spots in the southern counties of England. There are single, semi-double, and double forms, with colours ranging from pure white to deep crim-

duced in the winter, are perfectly formed; set in a background of glossy deep green foliage, they are very attractive. Owing to the density of its foliage, the Camellia is a handsome plant when not in bloom.

Propagation.—From seeds, layers, and cuttings, and by grafting and inarching. The first method is chiefly employed in the raising of new varieties, and for obtaining stocks of single forms on which to work double varieties. Single Camellias produce seeds freely, which should be sown, when ripe, over a gentle bottom heat. As choice double varieties do not usually grow and flower well on their own

roots, propagation by cuttings is largely adopted for raising plants of common species to form stocks. Select shoots of the partly-ripened wood in July, about 5" long, remove the lower leaves, and cut the stems off just below a joint. Dibble the cuttings into pots or pans containing a mixture of loam, peat, and sand. Place in a cold frame, and shade from strong sunshine. Growth will commence the following spring, when the plants should be placed in gentle heat. When established, transfer the rooted cuttings to pots, grow them in a cool temperature, and in the second spring they may be used as stocks. The best time for grafting is early in the year, before growth commences. Cut back the stock to within a few inches of the pot, and insert the scion, formed of young wood of the selected variety, by the method known as side-grafting (see GRAFTING). Place the plants under bell-glasses, hand-lights, or in a propagating frame in a low pit or shady part of the greenhouse till the union is effected.

Soil.—Equal parts of turfy loam and peat, with the addition of sharp sand and broken charcoal to keep the compost open. For plants grown in open beds or large tubs the material should be rougher than when they are confined to pots.

Camellias in Pots.—For greenhouse and conservatory adornment pot plants are very effective and easily managed. Camellias do not care for frequent disturbance, and healthy plants only require shifting when the pots are well filled with roots. The best time for the operation is immediately the buds are set, but before they commence swelling. If done before, the growth suffers a check, and if later, there is a danger of the buds dropping. Camellias object to forcing, but will stand heat and moisture when making new growth.

Camellias in Beds.—Permanent specimens planted out in large conservatories are effective at all times, and develop into fine bushes if room is unrestricted. Pruning, which is done immediately after flowering, consists of thinning out the shoots to avoid overcrowding, and shortening back any strong growths of a gross character that threaten to spoil the balance of the tree.

Watering.—No matter how Camellias are grown, careful watering is of vital importance, and neglect in this respect is the common cause of buds dropping. A sodden condition of the soil should be avoided by the provision of free drainage and a careful use of the watering can, but drought at the roots is fatal to the buds. The only time when a little dryness of the soil is permissible is when the plants are completing their growth, but after the buds are set the compost must be kept in an even state of moisture. Surface dampings are useless, for if the soil is dry at the top and wet underneath, the buds are sure to fall. When watering, therefore, apply sufficient to penetrate every particle of soil. This rule may well be followed the whole year round. When plants are making fresh growth, weak liquid manure from the stable, with a little soot, may be given with advantage, but the plants do not need it at any other period.

Enemies.—Green fly invariably affects plants when making new growth, and if allowed to increase it becomes a nuisance. Fumigation is the best means of checking it. Brown scale is sometimes troublesome, but the white scale is the Camellia's greatest enemy, as it gets into the crevices of the bark and infests the shoots and leaves. Brush the stems and sponge the leaves

with an insecticide, and remove the scale from the crevices with a sharp-pointed stick.

Select Varieties :—

Few of the true species are seen in cultivation, but there are numerous varieties, from which the following selection is made :—

alba plena, double wh.	imbricata, double red,
Augustina superba, ro.	flowers sometimes
Bealii rosea, deep crim.	marbled wh.
Boadicea, pk., tipped silver.	Jubilee, wh., marbled ro.
bonomiana, wh., banded red.	Lady Hume's Blush, flesh.
Chandleri elegans, light ro.	leena superba, salmon red.
Contessa Lavinia Maggii, wh., striped car.	mathotiana, bright red, imbricated.
Contessa Lavinia Maggii rosea, rosy red.	mathotiana alba, wh., imbricated.
Countess of Orkney, wh., striped car.	Marchioness of Exeter, dark ro., large.
Cup of Beauty, wh., ro., imbricated.	Mrs. Hovey, light pk.
C. H. Hovey, bright crim., imbricated.	Princess Frederick William, wh., tipped car.
C. M. Hovey, deep crim., distinct.	Pride of Waltham, flesh pk., tipped silver.
Donckelaari, crim., wh., semi-double.	Reine des Beautés, delicate ro., fine.
fimbriata, wh., notched petals.	Reine des Fleurs, bright red, imbricated.
Henri Favre, rosy salmon, imbricated.	Thomas Moore, car., large, imbricated.
	Valtevareda, bright ro., sometimes spotted wh., large.
	Wilderi, soft ro.

Principal Species :—

japonica, 20', common	known before the single.
Camellia, red. Most of the garden hybrids owe parentage to this species.	roseiflora, 3', Ap., ro.
— anemonæflora. Flower like a double Anemone.	Sasanqua, 6', Feb., wh. (syn. oleifera). A table oil is extracted from the seeds of this species.
reticulata, 10', spr., red.	theifera, 5', My., wh. (syn. Thea), China Tea.
— flore-pleno. Double form of the above,	— assamica, "Assam Tea."

CAMERARIA.

Smooth, erect-growing shrubs (ord. Apocynaceæ) requiring the heat and moisture of a stove. Propagation is by cuttings of side shoots with a heel of the old wood in sand under a bell-glass in heat. Use fibrous loam with a small quantity of peat and plenty of sand when potting.

Principal Species :—

dubia (see Wrightia dubia). lutea, yel. (see Malouetia).

CAMOËNSIA.

Magnificent stove climbers (ord. Leguminosæ), only one of which is introduced. The flowers are produced in pendulous, axillary racemes, the calyx being 6" to 7" long, and the petals 4". The latter are white, crisped at the margins, which are tinted with golden yellow. Increase is secured by imported seeds, and by cuttings of half-ripened wood in sand in a propagating case. For soil, use good, fibrous loam with one-third of leaf mould and sand.

Principal Species :—

maxima, wh., yel. Very difficult to flower in cultivation.

CAMOMILE or CHAMOMILE.

The medicinal Camomile is derived from the flowers of *Anthemis nobilis*, of which both the single and double flowered forms are used. This is a perennial herbaceous plant that has white

flowers with a yellow disc. It is propagated by division in spring, or by seeds sown at the same season. The plants should be planted from 8" to 12" apart in rich, light, sandy soil. The flowers are gathered as soon as they open and only when the weather is dry. They are afterwards placed to dry in a shady, airy place under cover from rain. The flowers thus prepared are used on account of their tonic and febrifugal properties.

CAMPANEA.

A very small genus of shrubby stove plants (*ord.* Gesneraceæ), with shaggy stems and leaves, and clusters of flowers from the axils of the leaves. Flowers large, rose or white, spotted internally. Propagation by seeds, and offsets from the tuberous rhizomes. Soil, fibrous, mellow loam, and leaf mould, with a little well decayed cow dung, rubbed fine, and plenty of sand.

Principal Species :—

grandiflora, 9", wh., crim.

CAMPANULA. (BELLFLOWER.)

Description.—Indispensable garden flowers (*ord.* Campanulaceæ), of much variety of form, a number being of tall and imposing habit, and suited for border decoration or for growing in pots for ornament; while others are of the dwarfiest stature and worthy of being grown in the choicest collection of Alpine flowers. Many are of tall, pyramidal habit, and others form little carpets covered with flowers in summer. All are perennial, except those otherwise marked.

Propagation.—Most of the perennial species are propagated by division, and also by seeds sown in spring under glass, or in the open in May. The seeds ought to be sown in pans or pots, and in a compost of loam, leaf soil, and sand. Cover, according to the size of the seeds, with finely sifted sandy soil, and place in a cold frame or greenhouse. Give air when the young plants appear, and shade from strong sun. The biennials should be sown in spring or in early summer, and liberally treated to secure strong plants for the following year. The annuals may receive the same treatment as half-hardy annuals. Alpine species are generally propagated by division, or by cuttings in pots placed under a frame and carefully watered, and kept a little close until they are rooted. *Pyramidalis* is so useful in pots that a few notes on its culture are advisable. It should be sown early in March, so as to have strong plants the following July. Sow in a temperature of about 60°, and prick off the seedlings into 3" pots, giving them gradual shifts, and wintering them in 6" pots until March, when they may be put into 8". It is also increased from suckers, taken off with a heel, and placed in pots of sandy soil in a cold frame.

Soil.—The greater number of the Campanulas of strong growth or of medium height like a good, loamy soil, well enriched with manure, but the Alpine species are improved and are longer-lived if in a somewhat gritty soil.

Other Cultural Points.—Most of the border Campanulas last much longer in bloom in a half-shady position than in one in the full sun. The taller species ought to be properly staked to prevent injury from high winds. The favourite basket plants, *fragilis*, *isophylla*, and *isophylla alba*, are barely hardy enough for many gardens; these are best propagated by cuttings in spring.

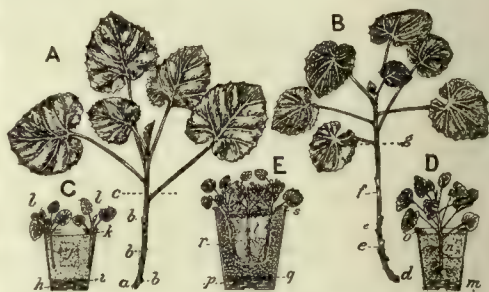
Principal Species and Varieties (*see also* PLATYCODON and WAHLENBERGIA):—

cæspitosa, 6", Jy., etc., bl. A charming little Harebell, of value for edgings or rockwork. There is a pretty wh. form, and also one with pale bl. flowers named *pallida* (*syn.* *pumila*).

carpatica, 9", Je., etc., bl. A valuable plant for the border or the rock garden, and one of the easiest to grow. It forms a neat plant with open, erect flowers. Good vars. are *Riverslea*, bl., *pelvi-formis*, pale bl., *alba*, wh., *pallida*, pale bl., and *turbinata*; the last is dwarfer than the type.

fragilis, 6", Jy., pur., wh. A capital basket plant, of great beauty in the window or conservatory (*syn.* *Barrelieri*).

garganica, 6", Je., etc., bl. A lovely little Alpine or pot plant. The var. *hirsuta* is even more attractive.



PROPAGATING WINDOW BELLFLOWERS
(CAMPANULAS).

- A** Cutting of equal-leaved Bellflower, *Campanula isophylla*, prepared for insertion (two-thirds of the natural size): *a* cut straight across just below a joint; *b* joints from which leaves are removed; *c* depth of inserting in soil.
- B** Slip—a young shoot slipped off the parent rootstock by downward pressure with the finger end, thus differing from a cutting: *d* heel, pared smooth with a sharp knife; *e* portion of short-jointed, firm wood, with leaves removed; *f* younger portion of shoot corresponding to a cutting, also with leaves removed; *g* depth of inserting in soil.
- C** Section of cutting pot (large 3" or 60's); *h* drainage; *i* a little rough material or thin layer of moss; *j* soil, light fibrous loam and one-sixth of sharp sand; *k* space for holding water; *l* cuttings, about six being placed around the side of the pot.
- D** A well-rooted cutting potted singly into 3" pot: *m* drainage; *n* soil, rich sandy loam with a little leaf mould or well-rotted manure added, and a few pieces of sandstone or charcoal to keep it open; *o* space for holding water.
- E** Rooted cuttings potted with ball entire into 48 pot, $4\frac{1}{2}$ " diameter, 5" in depth: *p* good drainage; *q* a little of rough parts of compost; *r* soil; *s* space for holding water; *t* ball of soil from cutting pot.

glomerata, $1\frac{1}{2}$ ", Je., etc., bl. A nice plant with clustered heads of rather tubular flowers. There are several good forms, among the prettiest being *alba*, wh., *pallida*, pale bl., and *dahurica* or *speciosa* bl.; there is also a double var.

isophylla, 1', Aug., bl. A charming plant for hanging baskets, or for warm situations on a sheltered rockery or old wall. The var. *alba* is very beautiful.

latifolia, 2', Jy., bl. A handsome native plant with tall stems which bear large, handsome flowers. The form *alba* is pleasing. The Caucasian form, *ericarpa*, has a hairy tube. The finest of the forms is *macrantha*, which has large, pur. bl. flowers. Its var. *alba* is a handsome plant.

Medium, 3½', Jy., various. The well-known Canterbury Bell, of which there are several forms and colours. It is a bien. The double vars. and those with "cup and saucer" flowers, named calycanthema, are general favourites. All make handsome border flowers, with colours varying from wh. to bl. and ro.

persicæfolia, 2' to 3', Jy., bl. This is probably the most valuable of all the border Campanulas,



Photo: Cassell & Company, Ltd.

CAMPANULA PERSICÆFOLIA.

its handsome spikes of showy flowers being universally admired. It has given rise to many beautiful forms, among which may be named *alba flore pleno*, wh.; *Moerheimii*, wh.; *coronata* and *c. alba*, bl. or wh., with cup and saucer flowers; *alba grandiflora*, large wh.; *grandiflora*, bl., large flowers.

portenschlagiana, 6'', Je., etc., bl. A most useful little plant for the front of the border, rockery, or wall. It blooms for several months. The form known as the "Bavarian var." has larger flowers and a more robust habit (*syn. muralis*).

pyramidalis, 5', Jy., bl., etc. The favourite Chimney Campanula, a very handsome bien., valued for pot culture. There are several shades of bl. and wh. A dwarfier form has lately been prized for some purposes where the taller vars. proved unsuitable. It can be grown outside as well as in pots under glass, but is liable to damp off in win., if the collar is not kept well up.

Trachelium, 2½', Jy., bl. The Nettle-leaved Bellflower is a useful border plant, especially in its double forms, which have bl. or wh. flowers. It is easily grown, and gives several shades of bl. and wh. (*syn. urticæfolia*).

Other Species and Varieties:—

- | | |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>abietina</i> , 1', Jy., bl. | <i>nobili-macrantha</i> , 2', Jy., bl. |
| <i>alliaræfolia</i> , 1½', Je., pale yel. (<i>syn. lamiifolia</i>). | <i>Nuttallii</i> , 1', Jy., bl. |
| <i>Allionii</i> , 3'', Jy., bl. (<i>syn. alpestris nana</i>). | <i>olympica</i> , 1', Jy., bien., bl. |
| <i>alpina</i> , 6'', Jy., bl. (<i>syn. obliqua</i>). | <i>patula</i> , 1', Jy., pale bl. |
| <i>americana</i> , 4', Jy., bl. | <i>preanthoides</i> , 1', Jy., bl. (<i>syn. Roezlii</i>). |
| <i>balchiniana</i> , 6'', Jy., hybrid, pale bl., trailer. | <i>primulæfolia</i> , 2½', Jy., pur. |
| <i>barbata</i> , 1', Je., bl. | <i>pulla</i> , 6'', Jy., bl. |
| <i>bellifolia</i> , 6'', Jy., bl., (<i>syn. Adami</i>). | — G. F. Wilson, 6'', Jy., bl. |
| <i>betonicæfolia</i> , 1½', My., bl. | <i>pulloides</i> , 6'', Jy., hybrid, bl. |
| <i>bononiensis</i> , 2½', Jy., bl. (<i>syn. obliquifolia</i>). | <i>punctata</i> , 3', Jy., pur. or wh. (<i>syn. nobilis</i>). |
| <i>carnica</i> , 6'', Jy., bl. | <i>pusilla</i> , 6'', Jy., bl. |
| <i>cenisia</i> , 3'', Je., bl. | <i>Rainerii</i> , 3'', Jy., bl. |
| <i>cervicaria</i> , 3', Jy., bl. | <i>ramosissima</i> , 9'', Jy., bl. |
| <i>collina</i> , 1', Jy., bl. | <i>rapunculoides</i> , 2½', Je., bl. (<i>syn. neglecta</i> , etc.). |
| <i>colorata</i> , 1', Sep., pur., tender. | <i>Rapunculus</i> , 2', Je., bl. |
| <i>dichotoma</i> , 6'', Jy., ann., pur. | <i>rhomboidalis</i> , 1½', Jy., bl. wh. |
| <i>drabæfolia</i> , 3'', Jy., ann., bl.; also wh. var. | <i>rotundifolia</i> , 2', Je., bl. wh.; double bl.; and other vars., such as <i>soldanellaeflora</i> , <i>Hostii</i> , and <i>H. alba</i> (<i>syn. tenuifolia</i> , etc.). |
| <i>Elatines</i> , 6'', Jy., pur. | <i>sarmatica</i> , 2', Je., bl. (<i>syn. gummifera</i>). |
| <i>elatinoides</i> , 9'', Jy., bl. | <i>saxatilis</i> , 9'', Je., bl. |
| <i>elegans</i> , 2½', Jy., bl. | <i>Scheuchzeri</i> , 1', Jy., bl. |
| <i>erinoides</i> , 1', Jy., ann., bl. | <i>sibirica</i> , 1', Jy., bl. or wh. |
| <i>Erinus</i> , 1', Jy., ann., bl. | <i>stenifolia</i> , 9'', Jy., bl. |
| <i>excisa</i> , 1', Je., bl. | <i>speciosa</i> , 4', Jy., bl. (<i>syn. longifolia</i>). |
| <i>foliosa</i> , 1', Jy., bl. | <i>Speculum</i> (see <i>Specularia Speculum</i>). |
| <i>Grossekii</i> , 2½', Je., bl. | <i>spicata</i> , 1', Jy., bl. |
| <i>haylodgensis</i> , 6'', Je., hybrid, bl. | <i>spruneriana</i> , 1', Jy., ann., bl. (<i>syn. Herminii</i>). |
| <i>Hendersonii</i> , 1', Jy., hybrid, bl. | <i>tomentosa</i> , 1', Je., wh. (<i>syn. laciniata</i> , Andr). |
| <i>Jacobaea</i> , 2½', Ap., grh., bl. | <i>tracheloides</i> , 2½', Jy., bl. |
| <i>laciniata</i> , 2', Jy., bl. | <i>tridentata</i> , 6'', Jy., bl. |
| <i>lactiflora</i> , 3', Jy., bl. (<i>syn. celtidifolia</i>). | <i>Vandesii</i> , 1', Je., wh. |
| <i>lamiifolia</i> (see <i>alliaræfolia</i>). | <i>Van Houttei</i> , 2', Jy., hybrid, bl. (<i>syn. Burg-haltii</i>). |
| <i>lanceolata</i> , 1', Jy., bl. | <i>versicolor</i> , 2½', Jy., bl. — Rosani. |
| <i>latiloba</i> , 3', Aug., pur. (<i>syn. grandis</i>). | <i>Vidalii</i> , 1', Jy., grh., wh. |
| <i>lingulata</i> , 1', Jy., pale bl. (<i>syn. capitata</i>). | <i>waldsteiniana</i> , 6'', Jy., bl., <i>tomasiniana</i> is a good var. |
| <i>linifolia</i> , 1', Jy., bl. | <i>Zoysii</i> , 6'', Je., bl. |
| <i>Lœflingii</i> , 1', Jy., ann., bl. (<i>syn. broussonetiana</i>). | |
| <i>Loreyi</i> , 1½', Je., ann., pur. | |
| — <i>rata</i> , 2', Jy., bl. | |
| <i>macrostyli</i> , 1½', Jy., ann., pale bl. | |
| <i>molliis</i> , 1', Je., bl. (<i>syn. microphylla</i>). | |

CAMPANUMÆA.

A small genus (*ord. Campanulaceæ*) of cool greenhouse herbaceous perennials, that require a

compost of good loam and a small quantity of peat. The plants are readily increased from seeds or by division.

Principal Species :—

lanceolata, 6', aut., grn. (correctly *Codonopsis lanceolata*).

CAMPELIA.

The name of this genus (*ord.* Commelinaceæ) refers to the habit the plants have of leaning

wood. The trees are cut down and the logs split up longitudinally, and after the concrete camphor has been removed, a further product of essential oil and resin, useful for embalming, is secured.

CAMPOMANESIA.

These are all American plants (*ord.* Myrtaceæ). *Lineatifolia* is grown in Peru for the sake of the yellow, fragrant fruits, called Palillo, which somewhat resemble the Guava. They are evergreen

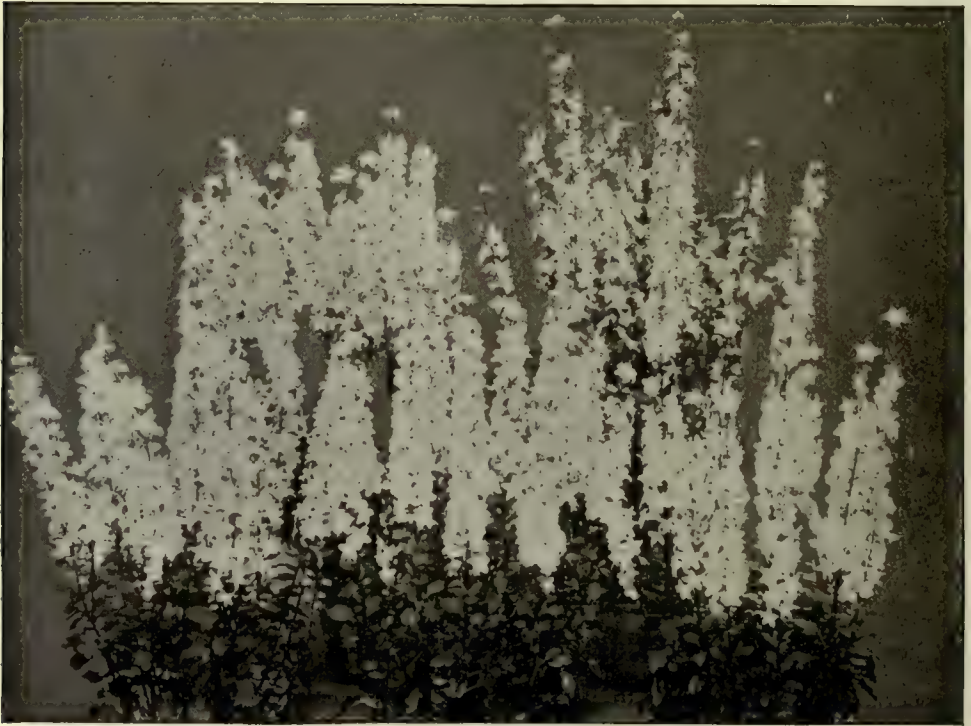


Photo: J. H. Wileman, Stourport.

CAMPANULA PYRAMIDALIS ALBA.

towards the sun. They require stove treatment, and thrive in any rich soil. Propagation is effected by seeds in sandy soil.

Only Species :—

Zanonia, 2', Aug., bl. (*syn.* *Tradescantia Zanonia*).

CAMPHOR.

The Chinese or common camphor of commerce, used largely in medicine, and even more to prevent moths and insects from damaging clothes and the contents of natural history cabinets, is the product of *Cinnamomum Camphora*, a fair sized tree of the Laurel family, native of China and Japan. Roots, stems, and leaves are alike aromatic, and the camphor is extracted by boiling numbers of small pieces in a shallow vessel, over which a bowl is placed to act as a condenser; on this condenser the camphor is deposited in masses of crystals. Camphor is also obtained from *Dryobalanops aromatica*, a tall tree found in Sumatra and Borneo; in this case, however, the camphor is found in hard, white, flaky masses in the fissures of the

shrubs, requiring greenhouse culture and any fertile well-drained soil. Propagation, by cuttings in very sandy soil beneath a bell-glass.

Principal Species :—

lineatifolia, 3', Ap., wh.

CAMPTOSEMA.

A small genus (*ord.* Leguminosæ) of attractive climbers, requiring greenhouse culture. Propagation can be effected by cuttings or by seeds. A compost of fibrous loam and decomposed leaf soil suits admirably.

Principal Species :—

grandiflorum, 6', aut., yel. *rubicundum*, 12', Je., Jy.,
pinnatum, 4', Aug., Sep., red or sc.
red, pur.

Camphora (*see Cinnamomum*).

Campion, Rose (*see Lychnis*).

Campteria (*see Pteris*).

Camptopus (*see Cephaelis*).

CAMPYLANTHUS.

These are greenhouse evergreen shrubs (*ord.* Scrophularinæ) that flourish in sandy loam and peat. Cuttings of the half-ripened growths root readily if inserted in very sandy soil beneath a bell-glass.

Principal Species :—

salsoloides, 1', Mch., pur.

CANANGA.

Tropical trees, mostly tall (*ord.* Anonacæ), from Java and India. They will grow in a stove in peat and loam.

Principal Species :—

monosperma. odorata, drooping yel. flowers.

CANARINA.

These are attractive winter flowering greenhouse herbaceous perennials (*ord.* Campanulacæ) that appreciate a rather warmer temperature when growth is commencing. The best compost consists of fibrous loam and peat with some coarse sand. Propagation is easily effected by division in spring, but cuttings may be rooted if great care is taken.

Principal Species :—

campanulata, 4', Jan., or. lævigata (*see* campanulata). (*syn.* C. Campanula).

CANARIUM.

The members of this genus (*ord.* Burseracæ) are all tall East Indian trees of economic value. The fruits of commune are eaten, and they also furnish a useful oil for lighting purposes. Other species yield a commercial resin known as Elemi. The species are seldom found in cultivation, but they may be accommodated in a stove in a compost of peat, loam, and sand, and are propagated by cuttings.

Principal Species :—

commune, 40', aut., wh. strictum, 30', aut., grn., wh.

CANARY CREEPER.

This is one of our most popular half-hardy climbers (*ord.* Geraniacæ). Plants raised from seeds sown under glass in spring grow rapidly when put out after all danger of frost is gone, and attain to a height of 10' or 12', when they will be smothered with the canary-coloured flowers from which the plant derives its popular name. It has the additional merit of thriving in towns if given a well-drained, sunny site and fertile soil. Strictly speaking, it is a perennial, but is best grown as an annual. The botanical name is *Tropæolum canariense*.

CANAVALIA.

This genus (*ord.* Leguminosæ) is mainly composed of stove evergreen twiners, but they are not possessed of much horticultural value. They grow well in a mixture of sandy loam and leaf mould, and may be propagated from cuttings in sandy soil under a bell-glass in bottom heat.

Principal Species :—

ensiformis, 6', Je., Jy., obtusifolia, 6', Jy., Aug., red pur. (*syn.* gladiata). pur.

Other Species :—

bonariensis, 10', Jy., pur. rosea (*see* obtusifolia).

Campylobotrys (*see* Hoffmannia).

Canary Grass (*see* Phalaris).

Canary Seed (*see* Phalaris canariensis).

CANBYA.

A perennial plant (*ord.* Papaveracæ) needing the shelter of a warm greenhouse. It can be raised from seed and grown in light loam.

Only Species :—

candida, 1½', Jy., wh.

CANDOLLEA.

This genus of evergreen shrubs (*ord.* Dilleniaceæ) was named in honour of the eminent botanist, De Candolle. They require greenhouse treatment, and a mixture of loam and peat in equal parts, with coarse sand. Propagation is readily effected by cuttings in sandy soil beneath a glass.

Principal Species :—

cuneiformis, 6', Jy., yel. tetrandra, 6', Je., yel. Huegelii, 6', Je., yel. (*syn.* calycina).

CANDYTUFT. (IBERIS.)

Both annual and herbaceous plants are included in the genus (*see* Iberis, *ord.* Cruciferæ), but there is a special interest in the many pretty annual garden varieties, obtained mostly from umbellata and coronaria. They are quite hardy, robust, not exacting as regards soil, and should be sown in March and April, in masses where they are intended to flower. In distinct or mixed colours they are most effective in the summer, and useful for cut flowers. There are tall and dwarf varieties, the former growing about 1' high, and the latter 6".

Varieties :—

Candytufts are offered in mixed or distinct colours. White Spiral is a fine var., producing large spikes of flowers. White Rocket also bears fine flowers. Other colours are car., crim., pk., and lil. A few vars. are sweet.

CANELLA.

These are stove evergreen trees (*ord.* Canellacæ), and have some economic value. A white oil is distilled from the aromatic bark. They thrive best in loam, peat, and coarse sand, and may be increased by cuttings of ripe wood under a bell-glass in bottom heat.

Only Species :—

alba, 40', Je., wh. laurifolia (*see* alba).

CANKER.

The term canker is very comprehensive, and is applied to fungoid diseases which affect various species of plants and in many cases are accompanied by different symptoms. The ill effects of canker are felt the most amongst fruit trees, particularly the genus *Pyrus*, and here the term is somewhat loosely applied, various unhealthy conditions of trees being attributed to canker. The true disease, however, is caused by a distinct fungoid growth known as *Nectria ditissima*, which affects young and old Apple trees under certain conditions, and also Pears, though less frequently. In these cases the wounds caused by canker are quite dry, but with trees possessing gummy constituents they almost invariably discharge. On Apples and Pears the first trace of the disease is cracking of the bark, followed by distorted swellings and, eventually, gaping wounds, which extend round the branch or stem, and

Candleberry Tree (*see* Aleurites).

Candle Tree (*see* Parmentiera).

Cane Brake (*see* Arundinaria).

Canistrum (*see* Echmea).

prevent the circulation of sap, in consequence of which the parts above the disease wither and die. An examination of cracks caused by the fungus, with a magnifying glass, frequently reveals a number of small crimson dots arranged in groups. These are the spore-bearing cases of the fungus. The latter gradually spreads over other parts of the tree, crippling its energies, and in some cases causing its death.

Canker in Fruit Trees.—Taking the Apple as the fruit which suffers most from canker, careful observation has led to the conclusion that the presence of the disease may be traced to various causes, primary and contributive. Though the easiest explanation to offer is that of weak constitution, it is nevertheless true that certain varieties of Apples are more liable to canker than others, and, except in the most favourable circumstances, these susceptible sorts invariably suffer more or less. Ribston Pippin and Lord Suffield are two varieties very liable to canker, though these and other susceptible Apples are quite free from the disease under certain conditions. Where Apples generally suffer from canker, varieties that are very liable to it should be avoided. Doubtless the chief cause of the disease is a lack of some element in the soil; certainly some soils are more suitable for Apple culture than others. Trees that are planted in cold, wet, undrained land, holding stagnant moisture, frequently suffer, and the same thing is observed when the medium is shallow and the roots penetrate into an unsuitable subsoil formed of retentive clay or marl. Poverty is also a prime cause of canker. From the want of proper nourishment trees get into a weak state of health, and are rendered liable to attack. Instances of this may be seen in old orchards, where the trees are debilitated by years of cropping and the absence of manure. Other conditions being favourable for the spread of the fungus, it is facilitated by abrasions of the bark and by the crossing and rubbing of branches. The splitting of the bark on young shoots through the agency of Woolly Aphis and other insects makes a loophole for the introduction and spread of canker. When poverty and unsuitability of soil are prime causes, steps should be taken to check the evil by feeding the trees and improving the rooting medium. If the mischief lies in the subsoil, means should be adopted for preventing the roots striking into it. These are preventive measures; for further particulars of remedies see *APPLE ENEMIES*.

Parsnip Canker.—Parsnips frequently suffer from a disease which causes soft, decayed patches round the crowns and down the sides of the roots. Except in bad cases, the disease does not penetrate far into the roots, though it spoils their appearance. The germs of the fungus remain in the soil after the removal of the crop, and the disease invariably appears the next season if Parsnips again occupy the same ground. The soil should be limed.

Parsley Canker.—Occasionally Parsley growing in poor soil dies off through a canker which affects the roots. It is generally in the winter when the plants fail, and the best remedy for the evil lies in a fertile soil and dusting affected plants with soot and lime.

Rose Canker.—Some Roses, chiefly climbers, and notably the popular favourite *Maréchal Niel*, are liable to canker, which frequently causes the death of the variety mentioned. The symptoms are ugly

swellings of the bark, at the junction of the Rose with the stock, as in the case of standards, at the ground line with trees worked on dwarf stocks, and in various places on old, strong shoots. A successful Rose grower has found that the best remedy is to make an incision through the bark with a sharp knife, beginning well above the wound, cutting through it, and carrying the incision below. This causes the bark to open widely, fresh bark quickly appears, and a channel is thus formed for a healthy flow of sap to the upper parts of the tree.

In addition to the instances quoted the roots and stems of other plants are more or less liable to canker in one of its various forms.

CANNA. (INDIAN SHOT.)

Description.—A large genus of tropical herbaceous perennials (*ord.* Scitamineæ) composed of a number of species and numerous garden hybrids and varieties. For many years the Canna was



FIG. 1.

FIG. 2.

PROPAGATING CANNAS BY DIVISION.

Fig. 1.—A fine Canna for planting out of doors.

Fig. 2.—A Portion of rootstock potted in 6" pot: *a* bud at base of flowered stem; *b* succession bud; *c* crocks; *d* soil; *e* space for water.

B Small division of rootstock: *f* extension bud; *g* bud at base of stem; *h* latent buds; *i* 4" pot.

C Small division of rootstock, usually discarded: *j* bud at base of flowered stem.

grown almost entirely as a foliage plant for sub-tropical bedding in the summer, but since the introduction of so many beautiful varieties these plants have become highly popular for the sake of their flowers. Since the advent of so many varieties the true species have dropped out of favour, and are not often seen in gardens. This is not to be wondered at, considering that garden varieties possess all the grace and beauty of the species as regards foliage, with the addition of gorgeous and many-coloured flowers. Monsieur Année, a French amateur, was one of the first to attempt the improvement of Cannas, but public interest in them was only fully aroused when Monsieur Crozy introduced his *Gladiolus*-flowered varieties. Since then the development has been remarkable, and in the *Orchid*-flowered section, first obtained by crossing the above varieties with the South American species *flaccida*, we have the largest flowered and the most brilliantly coloured Cannas. Possessing



SOME HIGH-CLASS CANNAS.

THEIR WONDERFUL MARKINGS ARE BRIGHTER THAN THOSE OF MANY ORCHIDS.

much charm in flower and foliage, these plants are unsurpassed for the decoration of greenhouses and conservatories, and they are highly effective for sub-tropical bedding in the summer.

Propagation.—By seeds and division of the roots in the spring. The former method is generally adopted for raising mixed varieties, but choice named sorts are increased by root division. Sowings may be made from January to March. The seeds are so extremely hard that they germinate very slowly unless assisted in this respect. The safest mode is to soak the seed in boiling water for a few minutes before sowing. Sow in well-drained pots filled with light, sandy soil. Cover the seeds with $\frac{1}{2}$ " of soil, and stand in a temperature of from 70° to 75°. When the seedlings appear, transfer them singly to small pots. The rootstocks of Cannas are vigorous, and may be divided in the spring before growth commences. Even small portions, furnished with crowns and a few roots, will make plants. The divisions should be placed in pots large enough for their accommodation, and be plunged in a bed of Cocoanut fibre refuse in a bottom heat of from 70° to 75°. The divisions will also start freely in a stove or warm greenhouse temperature. If wanted for bedding, the plants should be grown steadily till May, and then be hardened off, and planted out early in June.

Soil.—Cannas are gross feeding plants, and a suitable compost for pots is formed of equal parts of turfy loam and thoroughly decayed cow manure, with a little fibrous peat or leaf mould, and a free scattering of sand. The position of plants outdoors should be warm and sheltered, with a good depth of rich soil and plenty of moisture.

Plants in Pots.—The *Gladiolus*-flowered forms, being dwarf, are the most suitable for growing in 6" and 7" pots, and the *Orchid*-flowered varieties for 8" or larger. After the plants have made a good start in a warm temperature, they should be repotted as required, and be placed in a cool house for flowering. Water liberally during the growing period, and when the flower spikes appear feed the plants with liquid manure. In the autumn, when they show signs of resting, gradually withhold water, and keep the plants in a semi-dry state through the winter in a temperature of from 45° to 50°.

Plants Outdoors.—Given a suitable soil and situation, Cannas are more effective than the general run of bedding plants, and the dwarf hybrids are particularly attractive, lasting in good condition till late in the autumn. Some of the species make rich masses of graceful foliage, and are useful for associating with flowering plants to give variety. The dwarf, flowering hybrids are effective in beds, either in conjunction with other plants or grown alone. They may also be dotted about herbaceous borders with advantage. They require plenty of moisture, and watering and mulching are beneficial in dry weather. To winter them safely, take up the roots in the autumn, with soil attached, and store them in a semi-dry condition in a cool greenhouse, dry cellar, or outhouse, where they can be kept free from frost.

Select Varieties:—

Beautiful flowers may be obtained from the seeds which are offered of dwarf and tall growing hybrids, and novelties in the way of choice named varieties are continually being brought out. The following selection includes some of the best in cultivation:—

Gladiolus-flowered:—

Ami J. Chrétien, chestnut red, grn. foliage.	Ischia, sulphur, bright grn. foliage.
Aurore, bright red, grn. foliage.	Kaiser Wilhelm II., sc., grn. foliage.
Beauté Poitevine, red, grn. foliage.	Konigin Charlotte, bright red, edged gold.
Capri, salmon sc., glaucous foliage.	Lutetia, yel., spotted red, glaucous foliage.
Comte de Bouchaud, yel., spotted red, grn. foliage.	Madame Crozy, ver., edged gold, grn. foliage.
Duchess of York, yel., spotted red, dark grn. foliage.	Ménélik, reddish crim., grn. foliage.
Duke of Marlborough, maroon, grn. foliage.	Minerva, cinnabar red, large, dark grn. foliage.
Flamingo, red, very fine.	Paul Bruant, or. red, grn. foliage.
Germania, reddish crim., edged yel., large, grn. foliage.	Sultana, yel., ver. spots, glaucous foliage.



Photo: Cassell & Company, Ltd.

CANNA GRAF HERZOG ERNST LUDWIG VON HESSEN.
(Colour, orange crimson.)

Italian, or Orchid-flowered:—

Africa, sc., golden inside, pur. and grn. foliage.	Heinrich Seidel, red, yel. border, spotted pur.
Alemannia, sc., bordered yel., grn. foliage.	Italia, or. sc., yel. margin, grn. foliage.
America, sc., or., dark foliage.	Pandora, red, gold., pur. and grn. foliage.
Australia, salmon red, striped yel., grn. and br. foliage.	Partenope, or., shaded yel., broad grn. foliage.
Austria, canary, dotted br., light grn. foliage.	Phebe, sulphur, spotted car.
Burbankii, yel., grn. fol.	Pluto, red, flamed or., bronzy red foliage.
Ch. Naudin, red salmon, grn. foliage.	Professor Trent, or. red, splashed yel., pur. red foliage.
Edouard André, fiery red, or. yel. spots.	Suebia, canary, shaded bronze.
H. Wendland, sc., yel. border, very large, grn. foliage.	Wilhelm Beck, sulphur yel., sc. pencillings.

Principal Species:—

- Achiras, 5', red, foliage grn.
 — variegata, red, foliage variegated.
 aurantiaca, 6', or., foliage grn.
 discolor, 6', red, foliage pur. red.
 edulis, 6', pur., yel., foliage grn.
 flaccida, 3', yel., foliage grn.
 gigantea, 6', or. red, pur., foliage large and grn.
 indica, 3' to 6', yel., red, foliage grn. (many hybrids owe parentage to this species).
 iridiflora, 6' to 8', red, yel., foliage grn.
 limbata, 3', red, foliage grn.
 Warscewiczii, 3', sc., foliage grn., tinged pur.

CANNABIS. (HEMP.)

The only member of the genus (*ord.* Urticacæ) worth cultivating as a garden plant is sativa, known as the Indian Hemp, which is ornamental in the garden in summer. It is a hardy annual which will grow in any good soil. It grows from 4' to 9' high in gardens, and is cultivated in the same way as other hardy annuals. It is largely grown for its fibre also.

CANSCORA.

A small genus of annuals (*ord.* Gentianacæ) of no particular horticultural merit. They require the temperature of a stove. Plants may be raised from seeds sown thinly in sandy soil, covered with a square of glass and brown paper until vegetation has taken place. Thin and pot the young plants as may be necessary.

Principal Species:—

- decussata, 2', Je., Aug., wh. Parishii, 2', Jy., wh

CANTERBURY BELLS.

Description.—Popular hardy biennial plants (*Campanula Medium*, *ord.* Campanulacæ), useful for garden adornment in the summer and for pot culture. There are numerous varieties in cultivation, which may be divided into three classes: single, as seen in the oldest forms; doubles, in which several bells appear to be compressed into the outer one; and duplex flowers, which are produced by the varieties of *Medium calycanthema*. Owing to the peculiar manner in which one bell grows within the other, these are commonly called Cup and Saucer Flowers. Amongst the varieties of Canterbury Bells many colours are represented, the semi-double and double forms being the most effective.

Propagation.—From seeds sown in a sheltered position in the open. Prick off the seedlings, and transplant in the autumn. Seeds may also be sown in shallow boxes in a cold frame, pricking off the seedlings in the open when large enough.

Soil.—Ordinary garden soil will suffice, but it should be deeply dug and enriched with decayed manure.

Other Cultural Points.—September is the best month for transplanting seedlings to their permanent quarters. Lift them with good balls, and give every encouragement to establish them before the winter. When planted *en masse* in beds, in clumps in mixed borders, or in single lines, Canterbury Bells are most effective.

Pot Culture.—When lifting plants in the autumn pick out strong specimens and place them in 6" and 7" pots, using loamy soil with a little decayed manure. Grow the plants in a cold frame through the winter, and transfer to a light greenhouse stage in the spring. Apply liquid manure occasionally when flowers are showing. Plants may also be

lifted and potted early in May for house and conservatory adornment.

Varieties.—Amongst the double, semi-double, and single varieties there are numerous shades of colour, including white, blue, rose, pink, and lavender. Carefully saved seeds of separate varieties do not always produce plants true to colour, and seeds saved from double varieties invariably yield some single flowers. Of the true Cup and Saucer Flower there are blue and white varieties, as well as several other shades. The heights run from 2' to 3'.

CANTUA.

The *Cantuas* (*ord.* Polemoniaceæ) are very useful and beautiful evergreen greenhouse shrubs. They may be successfully grown in a mixture of loam, peat, and coarse sand. Cuttings root readily in sand, or very sandy soil, under a bell-glass.

Principal Species:—

- buxifolia, 5', Ap., My., rosy red (*syn.* dependens).

Other Species:—

- bicolor, 4', My., yel., red.

CAPILLARY ATTRACTION.

Water has many peculiarities, and among these is its great affinity for water, as seen in the case of dewdrops on a leaf or raindrops on a window pane. It also rises or is attracted upward through vessels of very small bore, being able under such conditions to overcome the slight atmospheric resistance. This fact is well known to gardeners, and is made use of when pans of minute seeds need watering, the base of the pan or pot being placed in water for a while, when the whole mass becomes moist by the force of capillarity. It is but a step from the seed pan to the garden, and here it has been proved beyond all question that deeply worked soil is, other things being equal, far the most fertile because of the larger amount of water which can rise through the soil interstices to supply the crops' demands, and deficiencies caused by evaporation. It is evident that capillarity can continue longer in 3' than in 1½' of soil, hence one advantage at least of deep trenching.

CAPPARIS.

This genus (*ord.* Capparidacæ) has great economic value, as from *spinosa* we get the well known caper of commerce. The majority of the species are stove and greenhouse evergreens. Propagation may be effected by cuttings of ripe wood in sandy soil beneath a bell-glass. The plants thrive in a mixture of peat and loam.

Principal Species:—

- acutifolia, 5', Je., Jy., wh. spinosa, 3', Je., hlf-hdy., wh.

Other Species:—

- linearis, 14', My., wh. nobilis, 8', Jy., wh.
 zeylanica, 5', Aug., wh.

CAPSICUM.

A genus (*ord.* Solanacæ) of great economic value, as the plants yield the chilli pepper of commerce, while the fruits are used in immense quantities for pickling. Well grown plants carry-

- Cacutcheon* (see *Ficus*, *Hevea*, and *Landolphia*).
Cape Gooseberry (see *Physalis peruviana*).
Cape Jasmine (see *Gardenia florida*).
Caper (see *Capparis*).
Caper Spurge (see *Euphorbia Lathyris*).
Caprifolium (see *Honeysuckle* and *Lonicera*).

ing fruit are highly ornamental for the stove and dwelling house. The genus comprises a number of hardy annual species, which are easily raised from seeds sown in frames in spring; and stove evergreen shrubs, which are also propagated from seeds. There are several garden varieties. They thrive best in a light, rich loam, and the pots must be efficiently drained. The Red Pepper, Chillies, and Capsicums are cultivated forms of *annuum*; while the Bird Pepper, Guinea Pepper, and Cayenne Pepper are varietal forms of *minimum*.

Annual Species :—

annuum, 1', Je., wh. *conicum*, 2', Je., wh.
cerasiflorum, 1', Je., wh.

low-growing sorts by seeds or layers; and taller ones chiefly by seeds, sown in spring. Well-drained soil suits the various species better than a damp and heavy one.

Principal Species :—

arborescens, 15', My., yel. (*syns.* *mongolica* and *Robinia Caragana*).

— *Redowskii* (*see figure*).

— *pendula*,

frutescens, 2½', Ap., yel. (*syns.* *digitata*, *frutex*, *rosea*, and *Robinia frutescens*).

Other Species :—

brevispina, 3', My., Je., grn., yel. (*syn.* *triflora*).



Photo: Cassell & Company, Ltd.

CARAGANA ARBORESCENS REDOWSKII.

Stove Evergreen Shrubby Species :—

<i>baccatum</i> , 2½', Je., wh.	<i>minimum</i> , 1', My., wh.
<i>globiferum</i> , 1½', Je., wh.	(<i>syn.</i> <i>fastigiatum</i>).
<i>grossum</i> , ½', Jy., st. bien., wh.	<i>ovatum</i> , 3', Jy., wh.
<i>luteum</i> , 1½', Jy., wh.	<i>pendulum</i> , 2', My., wh.
<i>micranthum</i> , 3', My., wh.	<i>pyramidale</i> , 2', My., wh.

A Selection.—Annuals.

Bull's Nose.	Golden Dawn.	Mammoth Red.
Prince of Wales.	Tomato Shaped.	

[These are good garden forms of *annuum*.]

A Selection.—Stove Evergreens.

Coral Red.	Pigmy.	Tom Thumb.
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[These are good vars. of *baccatum*.]
East India Cayenne. *Long Red.*
 [These are forms of *minimum*.]

CARAGANA.

A family of handsome shrubs or small trees (*ord.* Leguminosæ) from the cooler regions of Asia. Many species have long been cultivated in this country, where they are perfectly hardy. The choicer forms are best managed when grafted, in spring, upon the strong-growing *arborescens*; the

Chamlagu, 4', My., yel. (*syns.* *chinensis* and *Robinia Chamlagu*).

microphylla, 2', My., yel. (*syn.* *Altagana*).

pygmæa (of De Candolle), 1', My., yel. (*syn.* *arborescens gracilis*).

spinosa, 6', My., yel. (*syns.* *Robinia feróx* and *R. spinosa*).

tragacanthoides, 4', My., yel.

CARAGUATA.

Most of these interesting Bromeliads (*ord.* Bromeliaceæ) are more remarkable for the brilliant colouring of their bracts than for the beauty of their flowers. They are all stove plants, requiring good drainage, firm potting, and similar general treatment to that accorded to *Tillandsias* and *Billbergias*.

Principal Species :—

<i>andreaana</i> , 2', Je., car., yel.	<i>Peacockii</i> , 1½', Je., red, yel.
<i>musaica</i> , 1½', My., Jy., or., wh., ver. (<i>syn.</i> <i>Tillandsia musaica</i>).	<i>Zahnii</i> , 1', My., Jy., yel., sc.

Other Species :—

angustifolia, 1½', Jy., sc.,
yel.
osyana, 1½', Sep., red, yel.

sanguinea, 1', Nov., yel.
Van Volxemii, 2½', Aug.,
sc., yel.

CARALLIA.

One of the genera of Mangroves (*ord.* Rhizophoræ), and, like other plants that luxuriate in tropical brackish waters, not easily cultivated in this country. They require a high temperature, abundant moisture, and propagation by seeds or cuttings.

Principal Species :—

integerrima, 20', Jy., yel. (*syn.* lucida).

CARALLUMA.

These East Indian shrubs (*ord.* Asclepiadæ) need to be cultivated in this country in a stove, in a light, calcareous compost, such as will suit many Cacti. Half the compost may consist of mortar rubbish. Water must be sparingly given, except when growth is free. Cuttings should be dried somewhat before insertion, or they will damp.

Principal Species :—

adscendens, 2', Jy., pk.
crenulata, 6", Sep., grn.,
yel., pur. (correctly
Boucerosia crenulata).

fimbriata, 6', Aug., yel.
umbellata, 1½', Aug., pur.
(correctly Boucerosia
umbellata).

CARAPA.

Stove trees (*ord.* Meliaceæ) that are seldom cultivated, except in botanical collections. The various species have some medicinal value. All require stove treatment, and a compost of loam and leaf soil. Propagation by cuttings of ripened growths, in bottom heat.

Principal Species :—

guianensis, 20', aut., yel. moluccensis, 20', aut., yel.

CARAWAY.

Under the name of Caraway, the seeds of *Carum Carvi*, a hardy European Umbellifer, have long been popular among confectioners, cooks, and distillers. In some parts of Essex and Kent the Caraway was formerly grown extensively, but other crops have superseded it during late years.

CARDAMINE (DENTARIA).
(LADY'S SMOCK.)

Attractive, though not showy, plants (*ord.* Cruciferae) for the border or rock garden. Those here mentioned are hardy perennials. The Dentarias are now included with the plants generally grown as Cardamine. Propagation is by division after flowering, or by seeds sown in spring or early summer. Soil of a damp and rather heavy character is best; they prefer some shade also.

Principal Species :—

diphylla, 1½', My., wh. A pretty plant for a damp and shady spot in heavy or peaty soil (*syn.* *Dentaria diphylla*).

pratensis, 1½', My., wh. or pale pur. The double form in both colours, known as *flore pleno*, is very pretty. The type is the common Lady's Smock.

Other Species :—

asarifolia, 1', My., wh.
bellidifolia, 1½', Mch., wh.
bulbifera, 1½', Ap., pur.
chelidonia, 1', Ap., pur.
enneaphylla, 1', My., pale
yel.
Killiasii, hybrid, 1', My.,
pur.

laciniata, 1', Ap., ro.
latifolia, 1½', Je., pur.
maxima, 1½', My., pur.
pentaphylla, 1', My., pk.
pinnata, 1', My., wh.
trifolia, 9", My., wh.

CARDOON.

The Cardoon (*Cynara Cardunculus*, *ord.* Compositæ), which resembles a Globe Artichoke in appearance, does not meet with the favour in this country with which it is regarded on the Continent, where the stalks and midribs of the inner leaves are greatly esteemed in soups, salads, or when stewed like Celery. In a deep, sandy soil it is a profitable plant, and forms a noble-looking object when in flower. In such a soil, if inclined to dryness, trench culture produces the best results, but on heavy, wet land Cardoons should always be grown on the level. Towards the end of April sow the seeds on a warm border in drills, and thin to 4" apart as soon as the seedlings are large enough to handle. Keep well supplied with water if the weather should prove very dry, and finally transplant each carefully with a trowel, allowing a space of 1½' between the plants and 4' between the rows. Well water them in after planting, and afford plenty of moisture at all times during drought, as Cardoons are thirsty subjects. If growth has been free, the middle of August should find the plants ready for blanching, which is generally effected by drawing all the leaves of the plants together tightly and binding them round with haybands, soil which is first well pulverised being heaped up around them until the plant is covered, and all possibility of air effecting an entrance at the top prevented. This earthing up process is repeated until growth ceases, and in about eight or nine weeks from the commencement of blanching operations the produce should be fit for consumption. Well manured and well worked land, with copious waterings in dry weather, are the chief essentials to successful Cardoon culture.

CARDOPATIUM.

A half-hardy perennial (*ord.* Compositæ), closely allied to the Thistles and Echinops. On a warm, well-drained, and sheltered spot it will survive the winter if protected from frost. Seedlings may be raised in a frame or greenhouse.

Principal Species :—

corymbosum, 1½', Aug., bl.

CARDUNCELLUS.

Pleasing little hardy herbaceous plants (*ord.* Compositæ), of some value for rockeries, though hardly showy enough for the border. They produce small blue flowers resembling those of a Cornflower, and only grow a few inches high. The principal species are *mitissimus*, 9", June, blue; *monspeliensium*, 9", July, blue; and *pinnatus*, 5", July, blue. They are propagated by seeds or division in spring, and like a light, rather dry, soil.

CARDUUS. (THISTLE.)

The Carduus (*ord.* Compositæ) are well-known hardy annual, biennial, or perennial plants. They are hardly suitable for the garden, on account of their generally rather coarse habit, and the way in which they scatter their seeds. They are very effective as specimens, however, and may be introduced into wild gardens if they can be kept from increasing too rapidly. Among the best are *acanthoides* and *pycnocephalus*. Other plants often grown in gardens as *Carduus* will be found under *Cnicus* and other names.

Carambola tree (see *Averrhoa*).

Cardiochloa (see *Sagenia*).

Cardinal Flower (see *Lobelia cardinalis*).

CAREX. (SEDGE.)

An extensive genus of perennial, herbaceous, Grass-like plants (*ord.* Cyperacæ), of which only a few are of value for horticultural purposes. Of these, very few are adapted for the garden, the greater number being only suitable for the margins of ponds. A few are very pretty grown in pots. Propagated by seeds or by division in spring. Any common soil, kept moist.

Principal Species:—

baccans, 4'. A very effective plant, with red or pur. berries.

brunnea, 2' to 3'. Pretty; also known as gracilis. The form variegata, with lvs. striped wh., is worth growing. Hlf-hdy.

Pseudo-Cyperus, 3'. A very fine Carex, with triangular stems.

tristachya, 1'. Generally known as japonica, and a useful plant for growing in pots in rooms. The lvs. are striped with wh.

Other Species:—

arenaria, 1½'.

Grayi, 3', Jy.

intumescens, 2', Je.

paludosa, 2', My.

paniculata, 3', Je.

pendula, 4', My.

riparia, 1'. My. The

variegated form is pretty.

CAREYA.

Trees and shrubs (*ord.* Myrtacæ), with one or two exceptions. In India the several species are of minor economic value, but they are seldom cultivated in this country. They require to be treated as stove shrubs, except herbacea, which is a tender herbaceous perennial. Propagation by cuttings or root division.

Principal Species:—

arborea, 8', Aug., red, yel.

herbacea, 1', Jy., red, wh.

sphærica, 3', Aug., red.

CARICA.

Tropical trees (*ord.* Passifloræ) which produce the Papaw fruits. The latter are cooked and eaten by the natives of the land to which the trees are indigenous. The leaves have the peculiar property of making tender any meat wrapped in them. They require a stove temperature and a well-drained rooting medium of sound loam. Cuttings of ripe wood, carrying leaves, root readily in sand over bottom heat.

Principal Species:—

Papaya, 20', Jy., grn.

spinosa, 20', Jy., wh., grn.

Other Species:—

candamarcensis, 6', Jy., grn.

cauliflora, 20', Je., grn.

citriformis, 20', Jy., yel., grn.

erythrocarpa, 4', Jy., wh.

microcarpa, 20', Jy., wh., grn.

CARISSA.

This genus (*ord.* Apocynacæ) has economic value from the fact that its juice is sometimes used for the manufacture of rubber, while the fruit of Carandas is made into a jelly. The plants thrive in sandy loam and peat in a stove, and may be propagated from cuttings in sand in heat under a bell-glass. Perfect drainage is essential at all stages.

Principal Species:—

Carandas, 15', Jy., wh.

grandiflora, 10', My., wh.

Other Species:—

lanceolata, 5', Jy., wh.

ovata, 15', Aug., wh.

spinarum, 24', Jy., wh.

Xylopicron, 10', Jy., wh.

CARLINA.

Interesting Thistle-like plants (*ord.* Compositæ) which may be grown on the rockery or in a border in common soil. Only a few of the perennial species are worth growing. They are propagated by seeds sown in spring. The best are acaulis, 9", June, white; and acanthifolia, 1½', June, white.

CARLUDOVICA.

Stove perennials (*ord.* Cyclanthacæ), some of which are evergreen and others herbaceous; they are Palm-like in habit. Propagation may be effected by suckers, and the plants thrive in loam, peat, and sand.

Principal Species:—

Drudei, 4', Jy., wh.

palmata, 3', Jy., wh.

rotundifolia, 3', Jy., grn.,

wh.

Other Species:—

angustifolia (*see* Cyclan-

thus Plumeri).

ensiformis, 2', Jy., wh.

funifera, 4', Jy., wh. (st.

ev. cl.).

latifolia, 3', Jy., grn.

Wallisii, 2', Jy., wh., grn.

CARMICHAELIA.

A small genus (*ord.* Leguminosæ) of greenhouse evergreen shrubs, well worthy of attention. They are easily increased from cuttings in sand, and may be grown in peat and sand.

Principal Species:—

australis, 2', Je., bl.

Enysii, 1'.

CARNATION.

Description.—The Carnation (*Dianthus Caryophyllus*, *ord.* Caryophyllæ) has for many generations been a favourite garden flower, and some varieties were known to the early British gardeners. Few flowers are at present more popular or more likely to maintain the high

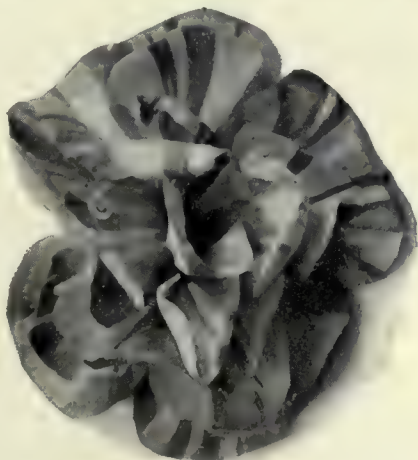


Photo: Cassell & Company, Ltd.

A FLAKE CARNATION.

position to which beauty, grace, and fragrance entitle the plant. If at present the self-coloured forms are in the ascendancy, there is yet room in the garden for the Bizarre, the Flake, and the

Picotee, with their beautiful markings. The self-coloured forms are of great value for the garden, and a considerable impetus has been given to their cultivation by the vigour and beauty of those

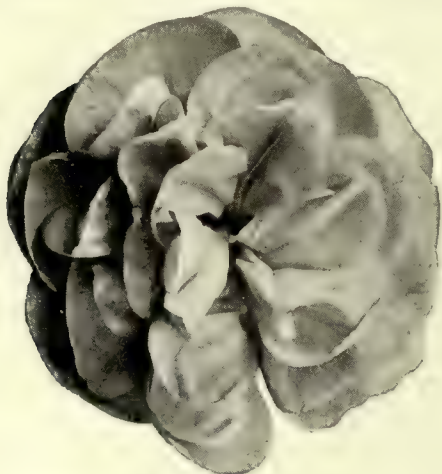


Photo: Cassell & Company, Ltd.

SELF CARNATION ENDYMION.

(Colour, scarlet rose.)

raised during recent years. For practical purposes and cultural details it is convenient to divide the Carnations into four broad groups: (1) the Border and florists' Carnations, which include those grown for exhibition at the summer shows; (2) the Tree Carnations; (3) the *Souvenir de la Malmaison* class; and (4) what are known as the *Margaret* or *Marguerite* Carnations, a group raised within recent years, often blooming the year in which they are sown, and showing tokens of being hybrids between the Carnation and the Pink.

Propagation.—By seeds.—This is the method by which new varieties are produced, and also that adopted for raising the *Margaret* Carnations. The Border and florists' varieties may be sown in pans or pots of sandy loam and leaf soil, filled to within 1" of the top, and placed in a slight hotbed or a greenhouse in April or May. The seeds must be sown thinly, and when the plants can be handled they should be pricked out into beds of rather richer soil, where they may remain until September, at which time they may be removed to the borders or pots in which they are to bloom. Care ought to be taken of the weakly seedlings, which often produce good flowers. The *Margaret* Carnations ought to be sown in heat in February. With good treatment they will bloom at the end of July, and will continue in flower for a long time. Sown later, they are good for winter and spring work under glass. The Tree Carnations may be sown about the same time as the last; they ought not to be planted out, but grown in pots, though placed in the open from the end of May until the beginning of September.

By Layers.—This is the way in which named and selected varieties are generally propagated. The best season is admittedly the end of July or beginning of August, although in some cold districts it is done earlier in the case of Border Carnations, so that the layers may become properly

rooted and can be planted before winter sets in. Plants in pots are denuded of the lower leaves of the branches which form the layers, and an incision is afterwards made below a joint, on the under side, and carried upwards through the joint. The layer should be pegged down with wire or other pegs, those made from the joints of the common *Bracken Fern* being as good as any, and the layered portion covered with about 1" of loam, leaf soil, and sand. The incision must be kept open. To secure this some place a small stone in it, though this must be carefully done, to avoid breaking off the layer. The old practice of shortening the leaves which remain on the layer is quite superfluous. Plants in borders should be surrounded with a mound of fine soil, into which the layers are pegged down. The shoots should not be overgrown by other plants.

By Pippings or Cuttings.—It is often difficult to secure enough layers of some varieties, and recourse must be had to cuttings or pippings, young shoots either taken off with a heel of old wood, or cut off close below a joint. The Tree Carnations are increased by slips from the main stems, taken in March and struck in hotbeds or in a forcing house. The other Carnations ought to be rooted in a frame with a slight bottom heat, and kept close and shaded until roots are formed. The pippings ought to be well watered when placed in position, so as to settle the soil about them.

Soil.—Three parts of good loam, made from the top spit of a meadow, about 4" thick, laid in a heap for a year and frequently turned; one part of good leaf mould, one of thoroughly decayed cow manure, and a sprinkling of sharp sand, with a little old mortar rubbish screened through a $\frac{1}{2}$ " sieve, make a capital compost for all Carnations, although they may be grown in any good, well-manured soil. Beds or borders in which

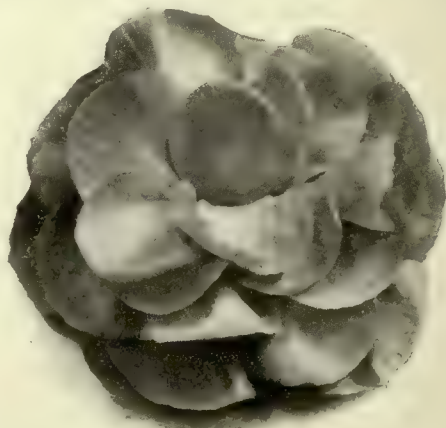


Photo: Cassell & Company, Ltd.

PICOTEE CHILDE HAROLD.

(Light edge, yellow ground.)

they are to be grown should have a good dressing of soot.

Other Cultural Points.—While in many places Border and florists' Carnations are perfectly hardy, yet heavy losses are sometimes sustained in severe winters. Thus it is always desirable to winter at

least a portion of the stock in frames. When the layers or pipings are rooted, usually early in September, the plants are potted (in pairs in the case of the exhibition flowers) in the soil described above, watered, and placed in the frames, which ought to be kept rather close for a week or a little longer. Afterwards they should have plenty of air, but not exposure to cold draughts. During winter they must be kept as dry as possible without suffering from drought, until February comes, when they ought to have a good supply of water. Plants for the border may be put out in March or a little later, according to the weather. Those intended to be bloomed in pots are repotted into 11" pots about the end of March, in pairs as before. After repotting, return to the weather and keep them close for a little while, removing them to a greenhouse to bloom. The Tree Carnations require a winter temperature of not more than 60° during the day, with not less than 55° at night.

Growing for Exhibition.—As many of the best flowers for exhibition come with burst calyces, it is necessary to use indiarubber rings or other soft ligatures, and also to cut the calyx a little open at two indentations at the top, so that the petals may expand properly. The flowers sometimes need paper collars, somewhat similar to those used on show boards, to prevent them from opening too flat. If grown in the open, they must also be protected from rain and strong sun by shadings or awnings. Staking is, of course, essential.

Diseases.—Unfortunately, the Carnation is subject to the attacks of some diseases and enemies. The principal of these are mildew, eelworm, wireworm, earwigs, green fly, fairy-ring spot, rust, and maggot. Mildew is checked by dusting with sulphur, and keeping the air in the frames or greenhouse rather dry, with free ventilation. It is apt to spread, and it may be necessary to cut off leaves or even destroy badly affected plants suffering from this or other diseases of a fungoid nature. Wireworm is prevented by carefully searching the soil, and by burying pieces of raw Potato under the surface, examining them every day for the wireworm. Green fly is destroyed by fumigation; red spider by syringing; plants badly affected by eelworm ought to be destroyed.

Varieties :—

The constant raising of new varieties in all the sections makes it impossible to give the names of varieties which are not likely to be superseded by others in a short time. Those named below are, however, among the best in their respective classes at the time of publication. There are others of value, but it is unnecessary to detail more than a few. It is advisable, however, to explain the distinctions between the classes. As the Picotees require the same cultivation, they are included also. There are four classes, viz. Bizarres, Flakes, Sells, and Picotees; though prizes are sometimes offered for what are known as Fancies. The petals of the Bizarres have a clear ground, flaked and marked with two or three colours; the Flakes have also a clear ground, but are marked with only one colour; Bizarres and Flakes must all be marked radially. The Picotees have a ground colour, edged with a second colour forming a broad or narrow margin, according to which they are classed as light or heavy edged. Sells are of one colour only, while the Fancies include flowers which do not well come under any of these classes.

Bizarres (scarlet, crimson, and pink and purple):—

Autocrat.	George Rudd.	Melody.
Biretta.	Harmony.	Patriot.
Bruce Findlay.	J. D. Hextall.	Robert Houlgrave.
Duke of York.	Master Fred.	Thaddeus.

Flakes (purple, rose, or scarlet) :—

Agricola.	Henry Cannell.	Mrs. Rowan.
Charles Henwood.	John Wormald.	Robert Cannell.
Fred Phillips.	Lady Mary Currie.	Squire Whitbourn.
Guardsman.	Mrs. Douglas.	Sybil.



Photo: Cassell & Company, Ltd.

CARNATION LADY CARLISLE. (Pink Tree.)

Fancies :—

Brodick.	Gitana.	Nellie Farren.
Czarina.	Hidalgo.	Perseus.
Don Juan.	Lady Ardilaun.	Persimmon.
G. Cruikshank.	Mogul.	Zanzibar.

Sells :—

Amy Robsart.	Endymion.	Mrs. Colby-Sharpin.
Bendigo.	Ensign.	Mrs. Eric Hambro.
Boadicea.	Etna.	Mrs. Weguelin.
Britannia.	Germania.	Water-Witch.
Cecilia.	Isinglass.	

Picotees (yellow ground) :—

Aurora.	Gronow.	Mrs. Robt. Sydenham.
Badminton.	Ladas.	Turenne.
Florrie Henwood.	Mrs. Henwood.	

Picotees (white ground) :—

Amy Robsart.	Isabel Lakin.	Miriam.
Beau Nash.	Little Phil.	Mrs. Gorton.
Duchess of York.		

Malmaison and Tree Carnations :—

Lady Carlisle (p. 175)	Miss Joliffe.	Uriah Pike.
Lady Grimston.	Nell Gwynne.	Winter Cheer.
Lady Isabel.	Primrose Day.	Wm. Robinson.
Lord Rosebery.	Trumpeter.	Yule Tide.

For borders, the *Sells* and *Fancies* are the most suitable.

CARPENTERIA.

A genus of one species (*ord* Saxifragæ), valuable for the greenhouse, but also succeeds out of doors when given the protection of a wall. It grows well in any fertile soil, and may be increased from seeds and cuttings.

Only Species :—

californica, 4', Je., wh., fragrant. An extremely beautiful shr. (*syn.* *Cassine caroliniana*). (*See figure.*)

CARPINUS. (HORNBEAM.)

These trees (*ord.* Cupuliferae) are valuable for the formation of hedges, as they grow very rapidly. They flourish in any good soil, and may be increased by layers, or seeds sown immediately they are ripe. All the species and varieties are hardy deciduous trees.

Principal Species :—

Betulus, 30', Mch. There are several vars., which range from 15' to 30'. Two have variegated foliage. Increased by suckers or layers.

Other Species :—

americana, 20', Mch. *orientalis*, 10', My. (*syn.* *caroliniana*). *duinensis*.
japonica, 15', Ap.

CARPODINUS.

Fruit-bearing evergreen shrubs (*ord.* Apocynaceae) that will be found to grow satisfactorily in well-drained loam and peat in the stove. Cuttings root freely in sandy soil under a bell-glass in heat.

Principal Species :—

dulcis, 8', Je., grn.

CARPOLYZA.

A pretty little bulbous plant (*ord.* Amaryllideae), of which there is only one species, named *spiralis*. It has white flowers, reddish on the exterior of the segments, on stems about 6" high; and narrow leaves. It is barely hardy enough for growing in the open, but may be grown in light soil in a frame or a cool greenhouse. It flowers about the end of April or in May. Propagated by division or seeds. (*Syns.* *Crinum spirale* and *Strumaria spiralis*.)

CARROT. (DAUCUS CAROTA, *ord.* Umbelliferae.)

The sandiest, sunniest part of the garden should be selected for the Carrot bed, as the roots will not thrive in wet, heavy land. In such soils it is necessary to make holes with a crowbar and fill up with light, sandy soil, one Carrot being allotted to every such station, to secure fine roots. Freshly manured ground should be avoided, as it has a tendency to induce forking and bad shape. If manure is employed it should be well decayed and deeply buried, but it is better to choose a piece of open ground which was manured for a previous crop.

Carpocapsa pomonella (*see Apple enemies*).

Carrion Flower (*see Stapelia*).

The earliest sowing outdoors may be made on a warm border in February, during a spell of mild weather, which allows of the land being readily manipulated. Choose for this crop a variety of the Short Horn type, allowing 6" or 8" between the rows, and sowing fairly thinly in shallow drills. The end of March or beginning of April will be soon enough for the main crop, which should be sown in shallow drills as advised for the earliest sowing, but allowing a greater distance between the rows—viz. 10" to 12" for medium growing varieties, and 12" to 15" for stronger ones. Thin sowing should be the invariable rule, and most growers find it advantageous to mix the seed previously with a little sand or dry soil, the whole being then scattered evenly throughout the drills and lightly covered in with a rake, drawing off all stones and lumps so as to leave the bed neat and tidy in appearance.

Thinning should be done with discretion, as it is quite possible, while avoiding any injury whatever



Photo: Cassell & Company, Ltd.

CARPENTERIA CALIFORNICA.

to the permanent plants, to so withdraw the surplus ones that nice Carrots may be secured for cooking, such being generally much appreciated for their tender, delicate flavour. All main crop Carrots should stand 6" to 8" apart in the rows, as this ensures a supply of handsome roots, which will repay the grower infinitely better than a double number of undersized, misshapen specimens.

Successional sowings of Short Horns may be made during the first week in August and the first week in October, for drawing and using as soon as large enough. In mild winters and in favourable soils and situations this last sowing will often remain good in the ground until spring, and will then yield a much appreciated supply of fresh Carrots.

Lifting and Storing.—On the approach of severe frost in October the main crop of Carrots should be very carefully lifted, some of the superabundant earth removed, the tops neatly cut off, and the roots stored in stacks with the heads outwards, filling in the crevices and covering with sand; or they may be clamped out of doors in the manner often practised with Potatoes.

Forcing.—Carrots are forced in frames on gentle hotbeds, the chief point to be remembered in this mode of culture being the production of a gentle, lasting heat, such as is afforded by mixing two parts of dead leaves with one part of long stable manure, and turning twice. About 1' in depth of fine soil should be put inside the frame on the hotbed, the seed sown broadcast, just covered with fine soil, and the frame then shut up. The heat in the frame should never exceed 70°, air being given at that temperature to keep it down to about 65°. Thin early to about 2' apart, give air on all favourable occasions, and protect with a mat or strawy manure during inclement weather. Radishes and Mustard and Cress are often grown with forced Carrots, and do no harm if cleared before interference with the rightful crop takes place. Frames and hotbeds are generally employed from November to February.

The Maggot.—The Carrot Fly (*Psila Rosæ*) is of a greenish black colour, with a rusty-looking head. Its larvæ live upon the roots of the Carrot, and

CARTONEMA.

This herbaceous perennial (*ord.* Commelinaceæ) can be raised from seeds sown in heat, and the seedlings thinned as may become necessary. It thrives best in the greenhouse, but will grow out of doors in warm situations in favoured localities.

Principal Species :—

spicatum, 1', Jy., bl.

CARYA. (HICKORY.)

A genus of North American deciduous trees (*ord.* Juglandæ), usually growing to a height of about 30', and valuable for their timber. The Americans make excellent chairs of Hickory. Propagation is readily effected by layers, grafting, and seeds, but it has been found that seedlings are impatient of transplantation. Any fertile soil.

Principal Species :—

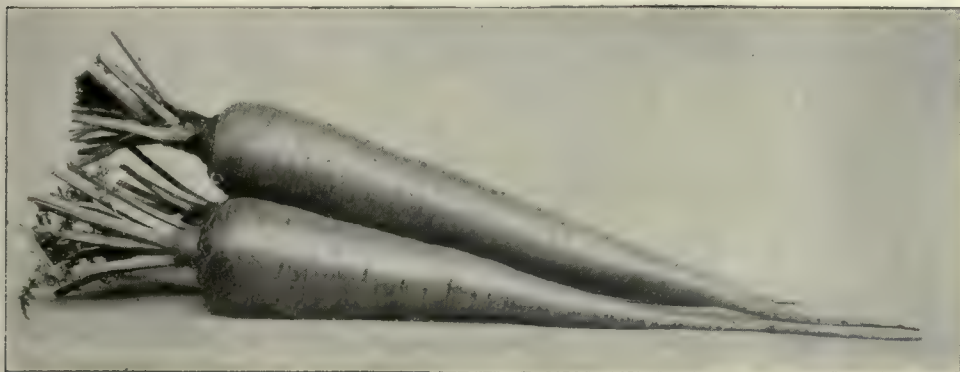
alba, 30', Ap. (*syn.* *ovata*).

amara, 30', My. (*syn.* *Juglans amara*).

porcina, 30', My. (*syn.* *glabra* and *obcordata*).

sulcata, 30', Ap. (*syn.* *cordiformis*).

laciniosa and *pubescens*.



A GOOD SELECTION OF LONG CARROTS, WELL GROWN.

often eat them to such an extent as to cause them to rot. Early trenching and exposure of the ground to the visits of insectivorous birds is the best way of checking its ravages, while the fact that late-sown crops suffer less than early ones may be advantageously noted. Always close the soil round the crowns of the plants after thinning, as the fly lays her eggs in the loose soil near the top of the young roots. A gallon of gas water mixed with 6 gallons of clear water and applied between the rows is excellent.

Select Varieties :—

<i>Short :—</i>	<i>Intermediate :—</i>	<i>Long :—</i>
French Forcing.	James's New.	Matchless.
Early Gem.		Surrey.

CARTHAMUS. (SAFFLOWER.)

Pretty, though rather coarse-growing, hardy annuals (*ord.* Compositæ), from the flowers of which a fine-coloured paint can be extracted. They are raised from seeds, which are sown on a hotbed, or in boxes under glass with a moderate heat, in spring, and the plants put out where they are to bloom. They grow in any good garden soil. The species cultivated are *lanatus*, 2', July, yellow; *Oxyacantha*, 2', July, yellow; and *tinctorius*, 3', June, orange, known as the Saffron Thistle. The first is sometimes called *Kentrophyllum lanatum*.

Other Species :—

olivæformis, 30', Ap. (*syn.* *angustifolia*).

tomentosa, 30', Ap. (*syn.* *Juglans alba* and *tomentosa*).

CARYOCAR.

A small but valuable genus (*ord.* Ternstroemiaceæ) of tall-growing trees. They produce Nuts which, in addition to possessing edible value, have an excellent oil extracted from their kernels. They thrive in a stove temperature in open, sandy loam, and may be increased from cuttings inserted in sand under a bell-glass over bottom heat.

Principal Species :—

glabrum, 100', Ap., gm.

nuciferum, 100', Ap., yel.

red.

tomentosum, 100', Ap., wh.

wh.

CARYOPTERIS.

Pretty shrubby or herbaceous perennials (*ord.* Verbenaceæ), of considerable value for the border, shrubbery, or rockery. The best is the shrubby species *Mastacanthus*, 2' to 3' high (*syn.* *Mastacanthus sinensis*), which has blue flowers in autumn; there is also a white variety. *Mongholica*, with violet flowers, and growing from

Carum (see *Caraway*).

Caryophyllus (see *Eugenia*).

2' to 3' high, is also pretty. They grow in common soil, but should have a warm situation. Propagated by seeds, division, and cuttings.

CARYOTA.

In their native habitats the Caryotas (*ord.* Palmæ) have economic virtues, providing a nutritious Sago (*C. urens*) for the natives, as well as a plentiful supply of Palm wine. Under natural conditions, they frequently grow to a height of 80'. All the species have greenish white flowers. In this country they should be grown in rich loam in the stove, where they will prove very attractive and ornamental. Propagation is readily effected by seeds.

Principal Species :—

<i>elegans</i> , 10'.	<i>mitis</i> , 25' (<i>syn.</i> <i>furfuracea</i>).
<i>majestica</i> , 12'.	<i>urens</i> , 60'.

Other Species :—

<i>Cumingii</i> , 30'.	<i>obtusata</i> , 20'.	<i>speciosa</i> , 20'.
<i>maxima</i> , 30'.	<i>rumphiana</i> , 20'.	

CASCADE.

Where running water passes through a garden an attractive feature may be made by arranging a cascade or waterfall. It may consist of flights of steps, as in the case of the great cascade at Chatsworth, or of rough stones placed in as natural a manner as possible in the bed of the stream. Anything stiff and artificial should be avoided.

CASEARIA.

This genus (*ord.* Samydaceæ) is composed of evergreen shrubs that succeed in the stove. Cuttings will root in very sandy soil under a bell-glass over bottom heat, and the plants flourish in fibrous loam and sand.

Principal Species :—

<i>hirsuta</i> , 8', Ap., <i>yel.</i> , <i>grn.</i>	<i>serrulata</i> , 5', Ap., <i>wh.</i> , <i>grn.</i>
<i>parviflora</i> (<i>see sylvestris</i>).	<i>sylvestris</i> , 8', Ap., <i>grn.</i> , <i>wh.</i> (<i>syn.</i> <i>parviflora</i> and <i>parvifolia</i>).
<i>parvifolia</i> (<i>see sylvestris</i>).	
<i>ramiflora</i> , 4', Ap., <i>yel.</i> , <i>grn.</i>	

CASIMIROA.

A Mexican evergreen tree (*ord.* Rutaceæ) which produces Apple-shaped edible fruit. It should be grown in fibrous peat and loam in the stove, and may be propagated by cuttings inserted in very sandy soil under a bell-glass in bottom heat.

Principal Species :—

edulis, 10', Jy., *grn.*; Mexican Apple.

CASSANDRA.

A pretty shrub (*ord.* Ericaceæ), formerly included with *Andromeda*. The principal form is *calyculata*, which has rather oblong leaves and wax-like, pure white flowers, and grows about 3' high at the most. *Angustifolia* is now considered to be merely a form of this. It is rather dwarfer, and has narrower leaves. Both flower about April. (*Syn.* *Andromeda angustifolia* and *calyculata*, *angustifolia* being also called *C. crispa*.) Peaty soil, moist, and partially shaded.

CASSEBEERA.

This genus (*ord.* Filices) is composed of rather rare stove, greenhouse, and hardy Ferns, which may be increased by division, and should be grown in peat and loam.

Cassava (*see Janissa Manihot*).

Principal Species :—

triphylla, 6'.

CASSIA.

Description.—A large genus (*ord.* Leguminosæ). Some species are attractive when in flower, their golden blossoms, and ample, cut foliage, rendering them useful for warm conservatory decoration, *corymbosa* being especially good. The value of the genus lies more in its medicinal and economic properties than its usefulness to horticulturists. The *Senna* is produced from several species. Most members are trees or shrubs, but others are herbaceous and annual.

Propagation is readily effected either by cuttings in April or from seeds sown in March.

Soil.—A well drained compost of loam, leaf soil, and sand suits almost all *Cassias*.

Other Cultural Points.—A stove or intermediate house will meet their requirements so far as heat is concerned, while moisture must be given abundantly when growth is active, but sparingly at other times.

Principal Species :—

<i>alata</i> , 12', Jy., <i>st. ev.</i> , <i>yel.</i>	<i>corymbosa</i> , 3', Jy., <i>intermediate</i> or <i>grh. ev.</i> , <i>yel.</i>
<i>biflora</i> , 6', Aug., <i>intermediate ev.</i> , <i>yel.</i> (<i>syn.</i> <i>fulgens</i>).	<i>siamea</i> , 6', Jy., <i>st. ann.</i> , <i>yel.</i> (<i>syn.</i> <i>florida</i>).

Other Species :—

<i>angustifolia</i> , 1', Jy., <i>yel.</i>	<i>montana</i> , 2', My., <i>yel.</i>
<i>artemisioides</i> , 2', Je., <i>yel.</i>	<i>nictitans</i> , 2', Jy., <i>yel.</i>
<i>auriculata</i> , 4', Aug., <i>yel.</i>	<i>occidentalis</i> , 3', Je., <i>yel.</i>
<i>glandulosa</i> , 5', Sep., <i>yel.</i>	<i>pubescens</i> , 2', Je., <i>yel.</i>
<i>marylandica</i> , 3', Sep., <i>yel.</i>	<i>Sophora</i> , 4', Jy., <i>yel.</i>
<i>mexicana</i> , 5', Je., <i>yel.</i>	<i>spectabilis</i> , 4', Je., <i>yel.</i>
<i>mimosoides</i> , 2', Jy., <i>yel.</i>	<i>tomentosa</i> , 15', Jy., <i>yel.</i>

Though over a hundred species are known, only about forty are in cultivation.

CASSINE.

Greenhouse evergreen shrubs (*ord.* Celastrineæ) that thrive in a mixture of loam and peat; they may be propagated by cuttings in sandy soil under a bell-glass.

Principal Species :—

Maurocenia, 5', Aug., *wh.*; Hottentot Cherry.

Other Species :—

athiopica, 5', Jy., *wh.* *capensis*, 6', Jy., *wh.*

CASSINIA.

This genus (*ord.* Compositæ) comprises one hardy annual, which may be raised from seeds sown in March or April; greenhouse herbaceous perennials, increased by division; and greenhouse evergreen shrubs, propagated by cuttings in the early spring. A compost of loam and peat is suitable.

Principal Species :—

<i>aculeata</i> , 2', My., <i>grh. ev. shr.</i> , <i>yel.</i>	<i>lopappus chrysophyllus</i> (of gardens).
<i>aurea</i> , 1', Jy., <i>grh. herbaceous per.</i> , <i>yel.</i>	<i>leptophylla</i> , 2', Aug., <i>grh. ev. shr.</i> , <i>wh.</i>
<i>denticulata</i> , 1½', Je., <i>grh. ev. shr.</i> , <i>pale yel.</i>	<i>longifolia</i> , 2', My., <i>grh. ev. shr.</i> , <i>yel.</i>
<i>fulvida</i> , 4', Aug., <i>hdy. ev. shr.</i> , <i>wh.</i> (<i>syn.</i> <i>Dip-</i>	<i>spectabilis</i> , 6', Jy., <i>hdy. ann.</i> , <i>yel.</i>

CASSIOPE.

Beautiful little Heath-like shrubs (*ord.* Ericaceæ), often included with *Andromeda*. Although hardy, they are not easily grown, and need a sandy, peaty soil, not too dry, partial shade, and shelter from

cold winds. Some grow them under shaded hand-lights, with plenty of air. They are propagated by layers. The following are charming plants: fastigiata, 9', May, white (*syns.* *Andromeda fastigiata* and *cupressiformis*); hypnoides, 9', June, white, red; creeping plant (*syn.* *Andromeda hypnoides*); and tetragona, 9' to 12", March, white (*syn.* *Andromeda tetragona*).

CASTANEA. (CHESTNUT.)

The Horse Chestnuts (*ord.* *Cupuliferæ*) are hardy deciduous trees, valuable for their timber, for the formation of avenues, and for solitary specimens in suitable positions. The Spanish or Sweet Chestnuts are very ornamental trees, and give in some districts an abundant supply of Nuts as well as an excellent timber. The Sweet Chestnut, *Castanea sativa*, makes a tree 50' to 60' in height, and there are several varieties, which are usually increased by grafting. The flowers of all are green or greenish white, and the leaves are very handsome. (*See also* CHESTNUT.)

A Selection :—

chrysophylla (*syn.* *Castanopsis chrysophylla*). *sativa* (and its several cut-leaved and variegated forms).

CASTANOPSIS.

About twenty-five species of trees and shrubs are included in this genus (*ord.* *Cupuliferæ*), which is closely allied to *Castanea*. Only two species have, so far, been introduced to this country. Propagation is by cuttings in a close pit for the stove species, in a cold frame for *chrysophylla*. Any ordinary garden soil will do.

Principal Species :—

chrysophylla, a dwarf ev. shr. with grn. and golden foliage, and long, dense catkins. It needs a sheltered position (*syn.* *sempervirens*).

CASTANOSPERMUM. (MORETON BAY CHESTNUT.)

A genus (*ord.* *Leguminosæ*) of greenhouse evergreen trees, increased by cuttings of the matured shoots in sandy soil under a handlight. A compost of loam two-thirds, and peat one-third, with sand, is suitable.

Only Species :—

australe, 40' to 50', saffron.

CASTELA.

There are only six species in this genus (*ord.* *Simarubæ*), which is thus small as well as unimportant horticulturally. Only two of the six have been introduced. One of them, *Nicholsoni*, the Goatbust, has pronounced bitter properties. The *Castelas* are spiny shrubs, needing the temperature of a stove or intermediate house. They may be propagated by cuttings of the semi-mature shoots. Soil, two-thirds loam and one-third leaf soil, with sand.

CASTILLEJA.

Herbaceous, sometimes sub-shrubby, plants (*ord.* *Scrophularinæ*), with large and showy bracts. Handsome, but rare in cultivation. Partially parasitic in habit. They are increased by seeds sown in a cold frame, and like equal parts of peat and loam, with sand.

Castalia (*see* *Nymphaea*).

Principal Species :—

<i>coccinea</i> , 1', Jy., hdy. herbaceous per., yel.; bracts sc.	<i>miniata</i> , 1' to 2', sum., hdy., yel.; bracts ver., sc.
<i>indivisa</i> , 6'' to 12'', sum., hlf-hdy. per. (but best treated as an ann.), grn., yel.; bracts car.	<i>pallida</i> , 6'' to 12'', Je., hdy. herbaceous per.; bracts wh. or yel.

Other Species :—

lithospermoides, 1', Aug., hlf-hdy., sc.

CASTILLOA.

A small and horticulturally unimportant genus (*ord.* *Urticaceæ*), of two or three species. *Elastica* has a milky juice from which a sort of rubber is obtained.

CASTOR OIL PLANT (*see* *RICINUS*).

CASUARINA.

Curious greenhouse trees (*ord.* *Casuarinæ*), with long, drooping, leafless branches. When small, they make elegant table plants, but they are very rarely met with. Increased by cuttings of the half-ripened shoots under a bell-glass, in sandy soil in spring; also by seeds, when these can be obtained. They like a compost of loam and peat, with a small quantity of finely-broken crocks or rough sand.

Principal Species :—

<i>distyla</i> , 15'.	<i>quadrivalvis</i> (<i>see</i> <i>stricta</i>).
<i>equisetifolia</i> , 15'.	<i>stricta</i> , 18' (<i>syn.</i> <i>quadrivalvis</i>).

CATALPA.

Description.—Trees (*ord.* *Bignoniaceæ*) with showy flowers and handsome leaves. *Bignonioides* is the best known and most handsome member of the genus. It is a favourite tree for planting upon the lawn, where its umbrageous and symmetrical head and bright flowers render it a conspicuous object.

Propagation.—By seeds sown in spring, in a cold frame for the hardy forms, in heat for the stove species; also by layers put down in spring, and by cuttings of tips of the ripened shoots in autumn. Cuttings of longissima and microphylla require brisk bottom heat to root freely.

Soil.—Any good garden soil will suit the hardy species; equal parts of peat and loam, with sand, the stove species.

Principal Species :—

<i>bignonioides</i> , 20' to 40', Jy., hdy., wh., spotted pur., yel. (<i>syn.</i> <i>syringifolia</i>) (<i>see</i> p. 180). There is a var. with yel. foliage.	<i>cordifolia</i> , 20' to 40', Je., hdy., wh. <i>Kæmpferi</i> , Jy., hdy., yel., spotted red, br.; flowers small, fragrant. <i>speciosa</i> (<i>see</i> <i>cordifolia</i>).
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Other Species :—

<i>Bungei</i> , 8' to 10', sum., grn., yel.	<i>microphylla</i> , 10' to 20', st., wh.; flowers usually in threes.
<i>longissima</i> , 30' to 40', st., wh.	

CATANANCHE. (CUPIDONE.)

Pretty perennials or annuals (*ord.* *Compositæ*), formerly used by Grecian women in making love potions. They grow in any soil, and can be dried for winter decoration. The species are propagated by seeds sown in spring. *Cærulea*, blue, and its blue and white variety, *bicolor*, are the best. They grow 2½' high, producing their pretty flowers on long stems. They flower in July and August. The annual, *lutea*, is little grown. It is about 1' high, flowers in June, and has yellow blooms.

CATASETUM.

Description.—A genus (*ord.* Orchidaceæ) containing upwards of eighty species of terrestrial and epiphytic Orchids, requiring a stove temperature: it includes *Monacanthus* and is allied to *Cynoches* and *Mormodes*. The plants have a curious habit of bearing two or three forms of flowers, some large and fleshy, with pronounced horns, and others smaller, less fleshy, and hornless. The seed-bearers are to be found in the horned section. All the flowers are curious, and many are showy, whilst some are distinctly fragrant.

macrocarpum bellum, pur. br.

— *caruosissimum*; curious, very fleshy.

— *chrysanthum*, bright yel. maculatum, 3', Sep., grn., spotted pur.

saccatum, flower very large, sepals and petals spotted pur., lip bright yel.

splendens, flowers much like those of *Bunger-*

othii, but with a conical yel. spur. Probably a natural hybrid between that species and *macrocarpum*. It is very variable, and many vars. are in existence. *Alicia*, *aurantiacum imperiale*, *leucanthum*, *Lindenii*, *o'brienianum*, *regale*, *rubrum*, and *washingtonianum*, are some of the best.



Photo: Rossiter, Bath.

CATALPA BIGNONIOIDES (*syn.* *SYRINGEFOLIA*), GROWING IN THE BOTANIC GARDEN, BATH. (See p. 179.)

Propagation.—By division of old plants, back breaks starting from the older pseudo-bulbs.

Soil.—Being epiphytes, *Catasetums* are at home when fastened to blocks of wood or in baskets, with or without a little sphagnum worked in here and there to hold the moisture. They may also be grown in pots in a mixture of three-fourths of crocks, one-fourth fibrous peat, and a surfacing of sphagnum, but the basket method is the better.

Other Cultural Points.—Plenty of water must be given through the growing period; afterwards little or none, as they enjoy a rest in the same way as a *Dendrobe*—that is, from the time growth is completed until the new growths begin to push.

Principal Species and Varieties:—

Bungerothii, pseudo-bulbs, 5" to 9", wh., large and showy.
— *album*, wh., lip spotted ro.
— *aureum*, light yel.
— *pottsonianum*, wh., blotched pur.
— *callosum*, 1', Je., br., yel.

christyanum, 6" to 9", dark red or chocolate br., grn. lip.
— *obscurum*, blk. pur., pur. side lobes.
macrocarpum, flowers 4" in diameter (*syn.* *tridentatum* and *Claveringii*).

Other Species and Varieties:—

atratum, Jy., yel., wh., pur.
barbatum, My., grn., pk., pur.

— *proboscideum*, beard of lip grn.

— *spinosum*, grn., blotched br., lip wh.

ciliatum, wh., grn. yel.

Claveringii (*see macrocarpum*).

cristatum, 2', Aug., grn., lip crested.

— *stenosepalum*, pur. br., barred dark pur.

discolor, slender, grn., yel.

— *vinosum*, wine red.

— *ferox*, grn., curious, not pretty.

fimbriatum, 6", Aug., yel., grn.

— *Coigniauxii*, wh., pur., lip fringed.

— *platypterum*, grn., wh., br.

— *viridulum*, grn., spotted red, pur.

garnettianum, light grn., spotted br.; close to *barbatum*, but smaller.

glaucoglossum, br.

globiflorum, Je., olive br.

Gnomus, spikes 18" long.

br., wh.; rare.

Lemosii, 6", grn., yel.

longifolium, Aug., grn., yel., tipped crim. (*syn.* *Monacanthus longifolius*).

luridum, grn.

macroglossum, grn., yel., br., pur.; very variable.

Naso, 2', Aug., wh., pur. ochraceum, yel.

pallidum. Close to *finetianum*, but shorter sepals and petals.

Phasma, grn., brn., close to *Gnomus*.

pileatum, wh.; sometimes regarded as a *syn.* of *Bungerothii*.

Randii, yel.

russellianum, 3', Jy., grn.

sanguineum, 6" to 7",

Oct., Nov., grn., spotted

dull red.

— integrule.

Scurra, pale yel. or creamy

wh.; fragrant.

tabulare, pale grn.

— serrulata, grn., yel.

wh., bluish wh.

tigrinum, wh., barred cinnamon; close to *barbatum*.

tridentatum (*see* *macrocarpum*).

trifidum, Je., grn., dotted pur.

Trulla, Sep., grn., br.

— maculatissimum, heavily spotted br.

— subimberbe, lip almost beardless.

viridi-flavum, sum., grn., yel., segments concave.

CATERPILLARS.

The larvæ of moths and butterflies, the caterpillar state being the first after emerging from the egg. There are many kinds, having different food plants, and amongst them are some of the most destructive pests in the vegetable and fruit garden. A thorough knowledge of their life histories and habits is of great service to the gardener. The destruction of butterflies, moths, chrysalids, and eggs is one means of prevention, but it is also necessary to adopt measures when the caterpillars are feeding. A brief description of some of the most injurious caterpillars is given below.

Brindled Beauty Moth Caterpillar.—Plum and Pear trees suffer from the ravages of this pest, which is the larva of a greyish brown moth (*Biston hirtaria*) that is on the wing in the spring. The eggs are laid in rings round the shoots, like those of the Lackey Moth, and the caterpillars, which are brown, with yellow dots, feed on the leaves in June and July. (For remedies, *see* PLUM ENEMIES.)

Cabbage Caterpillar.—This is the larva of the Cabbage Moth (*Pieris Brassicae*), and plays havoc with various members of the Cabbage family. The whitish brown moth makes its appearance during May and June, and deposits eggs on the leaves of the food plant. During the summer and autumn the green caterpillars give evidence of their voracious appetite by feeding on the hearts and leaves of Cabbages and kindred plants. (For remedies, *see* CABBAGE ENEMIES.)

Codlin Moth Caterpillar.—The Apple is the chosen food of this caterpillar, and large quantities of fruit are spoiled by it. The moth (*Carpocapsa pomonella*), an insignificant looking creature, deposits eggs as soon as the Apples are set, in the calyx end of the fruits, fastening them with a gummy secretion. The caterpillars pierce the fruits, eat the cores, and cause the Apples to fall prematurely. (For remedies, *see* APPLE ENEMIES.)

Goat Moth Caterpillar.—The Goat Moth (*Cossus ligniperda*) is one of our largest native moths, and its larva bores into the stems and feeds on the heart-wood of various trees. Willows and Poplars are the favourite food plants, but the pests are omnivorous, and feed on forest trees, Apple and other large fruit trees. The moth deposits eggs in the crevices of the bark in the summer, and the caterpillars make tunnels into the heart-wood, where they often remain in a larval state for two or three years. Their presence is detected by the excreta and sap exuded at the mouth of the tunnel, on the appearance of which, a piece of wire should be passed in to crush them. Perfect insects should

also be destroyed, and the dressing of trees for other pests acts as a preventive of egg-laying.

Gooseberry Caterpillar.—This is the larva of the Magpie Moth (*Abraxas grossulariata*), and its special office is to devour the leaves of Gooseberry bushes. The prettily spotted moths appear in June, and the eggs are deposited on the leaves of the food plant. The caterpillars soon appear, and feed with results that are disastrous if destructive measures are not adopted. (For remedies, *see* GOOSEBERRY ENEMIES.)

Lackey Moth Caterpillar.—Apple trees frequently suffer through the attacks of the caterpillars of the Lackey Moth (*Bombyx neustria*). The moths are on the wing in July and August, and deposit eggs in rings of pitchy matter round the young shoots. In the spring the caterpillars emerge and feed on the young leaves, being protected by a web spun round the foliage of the food plant. When nearly full-fed the colonies break up, and the individuals seek hiding-places wherein to pass the final stage. (For remedies, *see* APPLE ENEMIES.)

Raspberry Bud Caterpillar.—The buds and leaves of Raspberries form the chief food of this caterpillar, which is the larva of the minute moth *Lampronia rubiella*. The moth is on the wing in June, and eggs are deposited on the tips of the young shoots, on which the red caterpillars feed when hatched out. (For remedies, *see* RASPBERRY ENEMIES.)

Small Ermine Moth Caterpillar.—The larva of this moth (*Hyponomeuta padella*) feeds on the young shoots of Apple trees, and plays havoc among the tender Thorn leaves in hedgerows. The processes of egg-laying and feeding are similar to those of the Lackey Moth, and the methods of eradication are the same.

Winter Moth Caterpillar.—Apples, Pears, Plums, Walnuts, and Hawthorns, as well as Oaks and other forest trees, provide food for this destructive caterpillar. The male moth (*Cheimatobia brumata*) is on the wing in November; and the female, which is incapable of flight, ascends the stems of trees and deposits eggs on the branches. The greenish yellow larvæ emerge in great numbers in the spring and feed till the end of May, when they lower themselves by a thread and become pupæ beneath the soil. (For remedies, *see* APPLE ENEMIES.)

Other caterpillars are referred to under the crops which they attack.

CATESBÆA. (LILY THORN.)

Stove evergreen shrubs (*ord.* Rubiaceæ), with showy, funnel-shaped flowers having long tubes. Cuttings taken in spring root freely if placed in sandy soil in brisk heat. Soil, light turfy loam and fibrous peat, with sand. *Catesbæas* are very dirty plants, bug, thrips, and red spider all being fond of them.

Principal Species:—

latifolia, 4' to 5', Je. *spinosa*, 10' to 14', My.,
parviflora, 4' to 5', Je. yel.

CATHCARTIA.

Pleasing hardy herbaceous perennials (*ord.* Papaveraceæ), the principal species being *villosa*, which grows about 1' high, and has yellow flowers in June, and Vine-like leaves. It likes a moist, peaty soil, and half-shade. It is propagated by seeds or

(*Catchfly* (*see* *Silene*).

Catechu (*see* *Acacia*).

division, and is best adapted for the lower parts of the rockery.

CATOBLASTUS.

Stove Palms (*ord.* Palmæ), closely allied to Iriartea. Rare in cultivation. Propagation is by seeds. Soil, two-thirds loam, one-third decomposed cow manure, with sand. *Præmorsus*, 50' (*syn.* Iriartea præmorsa), has a remarkable development of aerial roots, which give considerable support to the plant.

CATOPSIS.

Stove herbaceous plants (*ord.* Bromeliacæ), closely allied to Tillandsia, under which genus it was at one time placed. (For culture, see TILLANDSIA.)

Principal Species:—

nitida, wh., long slender spikes, lvs. dark, shining grn. (*syns.* *Tillandsia nitida* and *Tussacia nitida*).

CATTELEYA.

Description.—In the whole vegetable kingdom it would be difficult to find a group of plants producing such exquisitely beautiful or gorgeously coloured flowers as the large genus *Cattleya* (*ord.* Orchidacæ). The *Cattleyas* of the labiata group have club-shaped pseudo-bulbs, while those of the guttata section are like elongated stems; the fragrant *Cattleya citrina*, which grows head downward, has ovoid pseudo-bulbs. Other species fill up the gaps between these extremes. Then there is a considerable difference in height, from *Aclandiæ*, 3" or 4" in stature, to *guttata* Prinzii or *Leopoldii*, about 3' high. The leaves are borne singly or in pairs at the top of the pseudo-bulbs, and in the case of strong growing labiata forms these are sometimes 1' long and nearly 3" broad, stiff and leathery, while those having elongated pseudo-bulbs are generally furnished with shorter, elliptic, oblong, or even rounded foliage, which is also thick and leathery.

Distribution.—*Cattleyas* all come from tropical America, and it is found that most members of the genus are grouped into three areas, one inhabiting the maritime provinces of Brazil; a second (the Colombian group) distributed through Colombia, Ecuador, and British Guiana; and a third (the Mexican group) distributed in Southern Mexico, Guatemala, Honduras, and Costa Rica. The most northerly *Cattleya* is *citrina*, and the most southern one *Loddigesii*. It is interesting to note that few species grow within 5° of the Equator, *superba* growing nearest it. Thus *superba* and *citrina* are at the extremities of the genus horticulturally, the former needing stove treatment and the latter a place in a cool intermediate house. So much, however, do elevation and proximity to the sea affect climate, that by far the larger proportion of the *Cattleyas* may be grown in this country in one house the whole year round.

Hybrid Cattleyas.—The garden-raised hybrids have become very numerous during late years, and in many cases they are more amenable to cultivation than the imported species. They generally—but not always—show the greatest relationship to the seed parent. Pollination is easily effected,

and seed can be ripened if care is taken to expose the plant to sunshine, but it must be remembered that seed-bearing weakens a plant considerably, and flowers should not be allowed to form on it until a year after the seed has ripened. Seed is best sown on the top of the potting material of a newly-potted *Cattleya*, where germination may take place in a few weeks. The tiny seedlings are delicate subjects, and must not be hurriedly removed to tiny pots. Having secured a cross, ripened seed, and raised seedlings, the grower has still to exercise a vast amount of patience, because *Cattleya* hybrids may first flower when four or five



Photo: Cassell & Company, Ltd.

CATTELEYA WM. MURRAY. (See p. 185.)

years old, but they often wait longer than this, and have been known not to flower until nineteen years old. The parents chosen should always be the finest forms of the particular species.

Cultural Requirements.—Where possible a house or division should be devoted to *Cattleyas* (and *Lælias*), but in any case the structure should be a roomy, light one, fully supplied with means of ventilation at the top, bottom, and sides. A double stage should be provided; the lower one to carry sufficient ashes, gravel or shingle to hold a quantity of moisture, and support above it an open trellis stage on which to stand the plants. All the stronger growers may be cultivated successfully in pots, but those which produce excessively long roots, or are of lowly growth, are best managed if placed in teak baskets and suspended near the roof. Free drainage is of the utmost importance, and when pots are used these ought to be two-thirds filled with crocks. Over this place a layer

Catmint (see *Nepeta*).

Cat's Tail (see *Typha*).

Cat's Tail Grass (see *Phleum*).

Cat's Thyme (see *Teucrium Marum*).

of sphagnum, and then, having made the plant firm—if necessary—by means of a stick embedded in the crocks, commence at one side and place a compost of two-thirds of fibrous peat to one of sphagnum among the roots, carefully working round the plant. Cattleyas should be raised slightly above the rim of the pot they occupy, and the compost should be made firm. The time to pot Cattleyas is when new roots are being emitted from the young growths, and this rule should be rigidly adhered to. As some species

ature. If the piping is ample some bottom air may be admitted all the year round, except during fogs or bitterly cold winds, though in the latter case the lee side of the house can be used. Air should be more largely admitted as the sun gains power. Towards the end of the summer it has been found a good plan to avoid free ventilation during the day, depending upon the damping of floors and staging, and upon shading, for a moderate reduction of temperature; this should be followed by ample bottom and side ventilation, provided



CATTELEYA LABIATA VERA (See p. 184.)

make a greater length of rhizome each season than others, this must be taken into account when potting, and the diameter of the receptacle regulated accordingly. Always allow room for two or three years' expansion of growth, as Cattleyas do not like being disturbed.

Temperature and Ventilation.—Broadly speaking, the temperature of the Cattleya house should be 60° by day and 52° to 55° by night during December, January, and February; 65° to 70° by day and 60° by night in March and April; a minimum of 70° by day and of 60° by night during May, June, July, August, and September; and 65° to 70° by day and 60° by night during October and November. The temperatures given for the colder months are necessarily those produced by fire heat, but advantage should always be taken of sun heat to secure more warmth and give a little extra ventilation. Closely connected with the question of heat is that of ventilation, and here it may be remarked that air should be admitted primarily for the purpose of strengthening the plants, and not, as is too often the case, for the reduction of the temper-

the weather is calm, at night, reducing the air supply again early in the morning. This plan has been followed successfully in several cases, notably in gardens not far inland.

Moisture and Shading.—Give Cattleyas a large supply of water at the roots and in the atmosphere when they are rooting and growing freely, but when growth has finished for the season the less the water-pot is used the better they will be, so long as the pseudo-bulbs do not shrivel. Damping down stages and paths must be regulated according to the weather and the condition of the plants. Some few species, notably the heat-loving superba, are never really at rest, and consequently must never be dry at the roots. Cattleyas like clear light, and it follows that heavy shading must be avoided; roller blinds of coarse-meshed material, run on supports that keep them 6" or so from the roof glass, are the best, and these should only be let down when there is a danger of sunshine scalding or otherwise harming the young leaves, or causing the flowers to fade rapidly. Shade is not required after the end of September as a rule.

Insect Enemies.—With attention to cleanliness and an occasional fumigation with some vaporising compound, Cattleyas are not difficult to keep free from insect pests. Both scale and mealy bug will attack them, if permitted, and if these gain a footing the cultivator will find them difficult to eradicate, as they find their way down to the bases of the pseudo-bulbs and along the rhizomes, infesting the surrounding material as well as the plant itself. The one great enemy of the Cattleya is the Cattleya fly, which occasionally finds its way into collections, in a larval state, in the pseudo-bulbs of imported Cattleyas. It is a minute insect, but its presence can be detected by the swollen growths in which it dwells and the tiny punctures through which it escapes. The removal and burning of all affected pseudo-bulbs is the only real remedy, and growers should always be careful to thoroughly examine imported plants before these are admitted to the rest of the collection, or wholesale disaster may follow.

Labiata Group.—To prevent confusion, a list of the labiata group and the names under which they are described is given. Labiata vera, dowiana, Eldorado, gaskelliana, lüddemanniana, Mendelii, Mossiae, percivaliana, Schröderæ, Trianae, Warneri, and Warscewiczii.

Principal Species and Varieties:—

Aelandiae, 5", My., Je., yel. grn., marked pur.
bowringiana, 14", Oct., Nov., ro. pur.
citrina, 4", Ap., golden yel.
dowiana, 14", Oct., Nov., yel., crim., gold; the var. aurea is richer yel., and Rosita has pur. shading on the sepals and petals.
Eldorado, 1', Jy., Aug., lil., wh., or., yel.; crocata, Owenii, splendens, virginalis, and Wallisii are fine forms.
gaskelliana, 14", Je., Aug., amethyst pur., or. yel.; alba, albens odorata, formosa, and speciosa are handsome vars.
guttata, 2' to 3', aut., yel. grn., spotted pur.; fine vars. of this species are Leopoldii and Prinzii.
hardyana, 1½', Aug., Sep., Oct., rich pur., lip pur., yel. A magnificent natural cross-bred between Warscewiczii and dowiana aurea; there are several beautiful forms in cultivation.
intermedia, 1½', Ap., Je., pur., or wh., dark pur. lip; alba is pure wh.; amethystina and Parthenia are beautiful vars.
labiata vera (p. 183), 1', Oct. Nov., rosy mauve, pur., yel. A few prominent vars. are alba, Princess of Wales, amethystina, Cooksoniae, flammea, foleyana, Mrs. Ash-

worth, R. I. Measures, and White Queen.
lawrenceana, 9", Mch., Ap., rosy pur.; rosea superba is a light, and atrorubens, a dark form.
Loddigesii, 1½', Aug., Sep., rosy lil., pur.; Harrisoniae is a var. with stouter flowers borne in Mch. and Ap.
maxima, 1½', aut., pale ro., lip lined pur.; alba and peruviana are good forms.
Mendelii, 1½', My., Je., wh., tinted ro., lip wh. or ro., yel. throat. A few of the best named forms are albescent, bella, Bluntii, Duchess of Marlborough, jamesiana, Morganiae, Oakes Ames, Prince of Wales, and rothschildiana.
Mossiae, 1½', My., Je., wh. to rosy pur., lip yel., pur. This beautiful form has many charming vars., chief among them being alba, Arnoldii, Beauty of Bush Hill, imperialis, Lady Wigan, Mariana, reineckiana, superba, and Wageri.
percivaliana, 1', Jan., Feb., lil., ro. pur., lip pur., dark yel.; alba and magnifica are good forms.
Rex, 1½', Jy., Aug., wh., lip wh., pur., gold.
schilleriana, 6", Ap., My., pur. br., lip marked yel., ro. pur. Hardy's var. and lowiana are particularly large and showy forms.

Skinneri, 10", Ap., My., ro. pur., wh., pur. Two distinct vars. are alba and Temple's.
superba, 10", Jy., Aug., ro. pur., lip crim., pur., yel. There is a wh. var. named alba.
Trianae, 1½', Jan. to Mch., wh. to deep ro. pur., lip wh. to pur., usually deep pur., or. yel. This is a most valuable Cattleya, and the following are a few of the

finest named forms: alba, Amy Wigan, Atalanta, Ernestii, hardyana, Juno, Memoria Lindenii, schröderiana, splendissima, tricolor, Venus, and virginalis.
Warscewiczii, 1½', Je., Jy., ro. to pur., lip deep crim., pur. or yel. throat. Fine forms of this, the largest flowered Cattleya, are Countess of Derby, Hillii, Mrs. E. Ashworth, and Sandere.



Photo: Cassell & Company, Ltd.

CATTELEYA SCHRÖDERÆ HIGHBURYENSIS.

(See p. 185.)

Other Species and Varieties:—

Amesiae, 1½', Je., wh., lip bluish, yel.
amethystina (form of intermedia).
bicolor, 2', Mch., Sep., grn., br., spotted pur., lip crim. pur.
Bluntii (form of Mendelii).
exoniensis (see Laeliocattleya exoniensis).
Forbesii, 1', Aug., Sep., yellowish grn., lip yel., red.
gigas (referred to Warscewiczii).
granulosa, 1½', Je., Sep., yellowish grn., spotted red, lip wh., yel. Of this there are several fine forms, under such varietal names as princeps, russelliana, schofieldiana, and superba.
guatemalensis (see Epicattleya guatemalensis).
Harrisoniae (form of Loddigesii).
Holfordii (see luteola).
imperialis (form of Warscewiczii).
iricolor, 6", My., wh., lip milk wh., marked pur., or.
Leopoldi (see guttata).
lüddemanniana (a form of labiata), 1', My., Sep., pur. ro., lip deep pur., yel. Good vars. are alba, Bassetii, Ernestii, sanderiana, and schröderiana.

luteola, 6", Nov., Dec., lemon yel., wh. (*syn.* Holfordi).

MacMorlandii (form of *Mossie*).

nobilior (*see* *walkeriana*).

Schröderæ (a form of *labiata*), 1', Mch., Ap., lil., lip lil., or. Pretty vars. of this are *alba*, *amabilis*, *eximia*, *high-buryensis* (*see* p. 184), and *Temple's*.

schofieldiana (*see* *granulosa*).

speciosa (referred to *luddemanniana*).

speciosissima (referred to *luddemanniana*).

Principal Hybrids:—

Apollo, Oct. (*Mossie* × *Aclandiae*).

Atalanta, Jy. (*guttata* *Leopoldi* × *Warscewiczii*).

Brabantia, Jy. (*Aclandiae* × *Lodigesii*).

brymeriana, My., natural hybrid.

calummata, Jy. (*intermedia* × *Aclandiae*).

chamberlainiana, Aug. (*guttata* *Leopoldi* × *dowiana aurea*).

dominiana, Oct., Nov. (*maxima* × *intermedia*).

Empress Frederick, Jy. (*Mossie* × *dowiana aurea*).

Eros, Aug. (*Mossie* × *walkeriana*).

Euphrasia, Sep. (*Warscewiczii* × *superba*).

Fernand Denis, My. (*Aclandiae* × *Warscewiczii*).

Fowleri, Aug. (*guttata* *Leopoldi* × *hardyana*).

Harrisii, Oct. (*guttata* *Leopoldi* × *Mendelii*).

Wagneri (form of *Mossie*).

Wallisii (form of *El-dorado*).

walkeriana, 6", Dec., lil. or rosy pur., lip wh., dark pur. apex. Choice vars. are *dolosa*, *grandiflora*, *nobilior*, and *schröderiana*.

Warneri (a form of *labiata*), 1', Je., ro. pur., lip pur., yel. The finest forms are *formosa*, *Hardy's*, *Pilcheri*, and *Ruckeri*.

waroqueana (referred to *labiata vera*).

kienastiana, Aug., Sep. (*luddemanniana* × *dowiana aurea*).

Lambershurst Hybrid, Oct. (*intermedia* × *citrina*).

Le Czar, Oct., natural hybrid.

Lord Rothschild, Oct. (*gaskelliana* × *dowiana aurea*).

Maggie Raphael, Dec. (*dowiana aurea* × *Trianae*).

Mantini, Oct. (*bowringiana* × *dowiana aurea*).

Maronii, Oct. (*velutina* [natural hybrid] × *dowiana aurea*).

Parthenia, Sep. (*calummata* [hybrid] × *Wagneri*).

Triumph, Oct. (*luddemanniana* × *lawrenceana*).

Victoria Regina, My., natural hybrid.

Whitei, Jy., Aug., natural hybrid.

William Murray, Ap., My. (*Mendelii* × *lawrenceana*, p. 183).

very hot weather prevail when the plants are "turning in."

Successional crops are obtained by sowing in April and May, pricking out the seedlings into nursery beds, and ultimately planting in permanent beds which may be somewhat damper and heavier than those allotted to the earliest plants. Plants from this sowing are very productive, and if afforded water during periods of drought will furnish nice heads for cutting towards the end of summer. The variety *Autumn Giant*, sown in April, yields, under treatment similar to that advised above, remarkably fine heads, which carry on the supply until the frosts of winter intervene. If cold pits are available they may be filled with plants of this variety packed rather thickly in any light soil, which will carry on the supply of useful, albeit small, heads of Cauliflowers for many weeks. Where no frames or pits are available, plants may be suspended by the roots in a cool, dark shed, when they will retain their freshness for a week or ten days, or the plants may be completely buried in sand, when they will keep for perhaps a month. Where the convenience does not exist for January sowing, a batch of plants may be raised on a border in August or September, pricked out into nursery beds, and ultimately potted singly in 3" pots and wintered in a cold frame from the middle of October. Plants thus wintered are planted out from their pots into good, rich soil in April, and generally head-in towards the end of May. Plants are also wintered in the borders, covered with hand-lights, which form a fairly efficient substitute for cold frames, and dispense with the need of potting. Early London, though an old variety, is still most extensively employed for this crop. (For enemies, *see* CABBAGE.)

A Selection of Varieties:—

Early London.	Pearl.
Extra Early Forcing.	Snowball.
Magnum Bonum.	Veitch's Autumn Giant.

CAULOPHYLLUM.

Uncommon tuberous hardy perennials (*ord.* *Berberidaceæ*), which come from North America and Manchuria. The principal species is *thalictroides*, 1', April, yellow. It bears blue berries, and is an interesting plant grown in sandy peat in the rock garden. Propagated by seeds sown when ripe or in spring, or by division of the roots after flowering.

CAUTLEYA.

This genus (*ord.* *Scitamineæ*), sometimes placed under *Roscoeæ*, contains one notable species, a stove perennial herb, requiring similar treatment to and propagated in the same way as the *Alpinias*. The flowers are showy, but the plant is of no great value. It has been variously described as *Roscoeæ gracilis* and *R. lutea*.

Only Species:—

lutea, 9" to 18", Aug., red, yel.

CAVENDISHIA.

A genus (*ord.* *Vacciniaceæ*) embracing about thirty species of stove evergreen trees and shrubs, natives of tropical America. Very few of them are known in gardens, and those usually under the old name of *Proclesia*. Increased by cuttings in a close frame in bottom heat. Soil, equal parts of turfy loam and fibrous peat, with sand.

CAULIFLOWER.

Though not so hardy as the Broccoli, the Cauliflower (*Brassica oleracea botrytis cauliflora*, *ord.* *Crucifereæ*) is more highly esteemed for its greater delicacy of flavour.

Soil.—A sandy loam, deeply dug and liberally enriched with farmyard manure, forms the ideal staple for the production of fine Cauliflowers. Heavy land should be well worked and exposed; and hot, dry, sandy soil rendered more tenacious by placing a good supply of cow manure at the bottom of the trench when the land is dug.

The first sowing should be made towards the end of January on a gentle hotbed, and the plants pricked out in a cold frame filled with good soil; or on a very warm, sheltered border, seeing that the plants are so protected that no check is experienced, otherwise "buttoning," as the premature production of small, useless heads is called, may ensue. When large enough the plants should be planted out on the best piece of ground available, hoeing and watering as necessary, and snapping one of the large leaves to protect the head should

Principal Species :—

acuminata, st., Nov., bl., red, with buds covered by sc. bracts (*syns.* Thibaudia and Proclesia acuminata).

cordifolia, st., red, wh. (*syns.* Thibaudia and Proclesia cordifolia).

spectabilis, st. or intermediate house, wh., flushed pk., rosy car. bracts. A handsome sub-cl.

CEANOTHUS. (MOUNTAIN SWEET OR RED ROOT.)

Description.—Very beautiful hardy, half-hardy, or greenhouse shrubs (*ord.* Rhamnæ), the hardier species and their varieties being very ornamental on warm, sunny walls. They are generally deciduous, but in the greenhouse some retain their leaves. The individual flowers are small, but are produced in considerable numbers together, and thus are very effective. Many named forms have been raised within recent years.

Propagation.—Some of the species may be raised from seeds sown as soon as ripe, or in spring, in a warm house; the whole by cuttings of young wood struck under glass in a little heat in autumn; or, preferably, by layers.

Soil.—A good, dry, rather porous soil is the best for the hardy and half-hardy species grown outdoors, but those grown under glass may have one of a richer nature.

Other Cultural Points.—Although the outdoor Ceanothuses require a dry soil, they must not be allowed to suffer in dry weather while making growth, or when in bloom; good soakings of water may be given at intervals. On walls they ought to be pruned in April, or a little sooner in early districts. When the allotted space has been covered, cut the shoots back to two or three eyes for the production of young wood, on which the flowers appear, except in the case of those species which flower on the previous year's wood. Most of the Ceanothuses should have some protection, such as a mat, in severe weather.

Principal Species :—

americanus, 5', Je., Jy., wh. Among the hardiest. The var. variegatus has lvs. variegated with yel. (*syn.* intermedius.)

azureus, 10', Je., Jy., pale bl. One of the best and fairly hdy. Good vars. of azureus are Albert Pittet, albidus, Gloire de Versailles (very reliable), Marie Simon, and Othello.

dentatus, 10', My., bl. Desirable, though generally needing protection (*syn.* lobbianus).

veitchianus, 9', Je., bl. A pretty and useful species.

Other Species :—

cuneatus, 4', Je., hlf-hdy., bl. (*syns.* verrucosus and macrocarpus).

divaricatus, 4', Jy., pale bl.

Feudleri, 5', Jy., wh. (*syn.* Fenollei).

floribundus, 4', Jy., bl.

integerrimus, 6', Jy., hlf-hdy., wh. (*syns.* californicus and nevadensis).

microphyllus, 2', Je., wh.

ovatus, 3', Je., Jy., wh. (*syn.* fontanesianus).

papillosus, 3', Je., hlf-hdy., bl.

prostratus, 3', bl.

rigidus, 6', Jy., hlf-hdy., bl.

thyrsiflorus, 9', Jy., hlf-hdy., bl.

Cayenne (see Capsicum).

Cecidomyia (see Pear Midge and Herdrian Fly).

CECROPIA.

A small genus (*ord.* Urticacæ) of handsome stove evergreen trees, whose economic value lies in the indiarubber which is obtained from some of the species. The flowers are borne in catkins. They grow admirably in a mixture of loam and peat, with coarse sand. Cuttings of ripe wood root readily in very sandy soil under a bell-glass over bottom heat.

Principal Species :—

concolor, 20', Mch.

frigida, 12', Mch.

palmata, 25', Mch.

peltata, 30', Mch.

CEDAR.

The Cedar of Lebanon is Cedrus Libani (which will be found under Cedrus), the Prickly Cedar is Cyathodes acerosa, and the name Sharp Cedar is applied both to Juniperus Oxycedrus and Acacia Oxycedrus. The Barbadoes or Bermudas Cedar is Juniperus bermudianus.

CEDRELA.

A genus (*ord.* Meliaceæ) of stove trees. The fragrance of the wood resembles that of the Cedar. Odorata is known as the West Indian Cedar. They thrive well in sound loam and leaf mould, and may be increased from cuttings in heat under a glass.

Principal Species :—

australis, a form or *syn.* of Toona.

odorata, 50', Jy., pk., wh.

sinensis (*syn.* Ailantus flavescens).

Toona, 55', Je., wh., pk. velutina (now Chickrassia tabularis).

CEDRONELLA.

With one exception (triphylla) the species of this genus (*ord.* Labiatae) are herbaceous perennials, and thrive best in the greenhouse. A compost of loam and peat suits them admirably, and propagation may be effected by division of the roots.

Principal Species :—

cana, 3', Je., red, crim.

cordata, 1', Jy., lil.

mexicana, 2½', Jy., pale

pur.

pallida, 2', Sep., ro.

triphylla, 3', Jy., pale

pur. This is a grh. ev. shr., and must be increased from cuttings in sandy soil; by some authorities it is now referred to canariensis.

CEDRUS. (CEDAR.)

Description.—Majestic Coniferous trees, which form conspicuous features in favourable situations in this country. Cedrus Libani is the scriptural Cedar of Lebanon, so familiar to all readers. It is very imposing when it attains a large size, with its spreading habit at the top, and its massive branches. There are many specimens in this country over 50' high, and one at Strathfieldsaye, Hants, is said to be 120' high. It is perfectly hardy. Atlantica, the Mount Atlas Cedar, is of even more value for ornamental planting, its glaucous foliage rendering it very conspicuous and pleasing; while its pyramidal habit, not so pronounced as to be stiff, greatly adds to its beauty. It is the best of the three species for general planting. Deodara, the Deodar or Indian Cedar, from north-west India, is also a noble tree, although less hardy than the foregoing. Its form is very handsome, and the lower branches in good specimens are of great length, and cover a large space.



Photo: Cassell & Company, Ltd.

AN OLD CEDAR AT KEW.

Propagation.—By seeds sown in April in pans under glass, the young plants being transferred to their nursery quarters the next spring. Also by grafting the more ornamental forms on those of the common species in February in a propagating house. Grafting on the Larch is not recommended by those who have had experience.

Soil.—A deep, sandy soil, or one rather heavier if well-drained.

Principal Species and Varieties :—

atlantica, 80' to 100', habit pyramidal, lvs. about 0·5" long, glaucous or silvery. Branches horizontal, and cones resembling those of *C. Libani*. The var. *argentea* is exceedingly glaucous, and is of an almost silvery whiteness. The var. *aurea* has the young foliage of a fine golden colour, changing to grn. the following year.

Deodara, 200' to 250', in its native country, with a girth of sometimes 15' to 20'. Habit rather pyramidal, and branches mostly horizontal, although the lower ones are often depressed to the ground. Lvs. from 0·75" to 1" long. The vars. of *Deodara* are *argentea*, with silvery foliage; *aurea*, with the young foliage yel., changing to grn.; *crassifolia*, with shorter and thicker lvs.; *robusta*, with larger and stouter branches; *verticillata glauca*, with whorled glaucous lvs. on the young shoots; and *viridis*, with deeper grn. foliage.

Libani, 50' to 80' high, spreading, rather table-shaped form. The lvs. remain from three to five years on the tree, and are dark grn., and from 0·75" to 1·25" long. The leading vars. are *brevifolia*, which has shorter lvs. and smaller cones; and *glauca* (*syn. argentea*), which has glaucous foliage, particularly when old. A truly noble tree.

CELANDINE.

The popular name of two British wild flowers, one of which, *Chelidonium majus*, the Greater Celandine, is found on old walls and waste spots, and yields when pressed a yellow juice, much esteemed by country folk as a cure for corns, warts, and toothache. The Lesser Celandine, *Ranunculus Ficaria*, is a totally different plant, and grows in immense numbers in moist meadows, being one of the earliest flowers to greet the spring sun (*see* *RANUNCULUS*).

CELASTRUS.

This genus (*ord. Celastrineæ*) comprises hardy deciduous climbers as well as greenhouse and stove evergreen shrubs. The hardy species should be layered for propagation, or seeds may be sown when procurable. The shrubby species must be increased from cuttings. A mixture of fibrous peat, loam, and sand is suitable.

Principal Species :—

<i>articulatus</i> , 15", Je., grn. (<i>syns. Orica</i> of gardens and punctatus).	<i>lucidus</i> , 2', My., wh. <i>Orixa</i> (of Sieb and Zucc), 6' to 9', sum., grn. (<i>syn.</i> <i>japonica</i>).
<i>buxifolius</i> , 4', My., wh. <i>casinoides</i> , 5', Aug., wh. (correctly <i>Gymnospora</i> <i>casinoides</i>).	<i>scandens</i> , 20', My., yel. (<i>syn. bullatus</i> of Lin- naeus).

CELERIAC. (TURNIP-ROOTED CELERY.)

Much hardier than ordinary Celery, and develops a base somewhat like that of a Kohi Rabi. It is excellent for soups and stewing. Seed should be sown in gentle heat in March. During its early stages it should be treated as Celery. At planting

out time, however, the treatment differs, as *Celeriac* needs no trenches to bring it to perfection, but will thrive on the level in rich, light soil. Planting should be as shallow as possible, the plants allowed 18" of space all ways, and all side shoots removed to throw the whole vigour of the plant into one central stem. Water the plants well in, never allow them to feel the need of water, and when hoeing to destroy weeds remove as much soil from around the plants as possible, as the more the base is exposed, in reason, the finer the produce. Towards the end of the season, when growth is finished, cover the bulbs with a coating of dry soil, and lift them early in October, when they may be stored in sand until required for use.

CELERY.

This British wild plant (*Apium graveolens, ord. Umbelliferae*), which in its native ditches and unblanched state is credited with the possession of poisonous properties, has been so vastly improved by years of patient cultivation and selection that to-day it is hardly too much to say that it ranks in the first flight of garden esculents. Good culture should be accorded at every stage of its growth. Abundance of moisture and liberal supplies of food are necessary, for the Celery is a veritable glutton among vegetables, and will thrive on well-rotted manure alone, though in practice this is not generally allowed.

Sowing.—The first week in March may see the seeds sown for the earliest supply, the services of a hotbed or warm house being requisitioned to assist germination. The plants should be pricked off when large enough to handle, in a bed of soil placed close to the glass on a mild heap of fermenting materials. Afford plenty of water, and gradually inure the plants to the outside temperature by tilting the lights, until it is deemed safe to place them outside in a warm border previously trenched and prepared for their reception. If afforded slight protection during possible severe weather a very useful lot of good quality sticks should be available for use at an early date. For the main crop, seeds may be sown a fortnight later in a similar manner to the first batch, the seedlings being pricked off, after hardening, into a warm border out of doors, where some slight protection may be given if required. A final sowing may be made in April on a warm, rich border outside, and protected if necessary.

The trenches for the reception of the plants should be prepared some time previously, and should be 18" wide, 10" to 12" deep, and have 4" of good farmyard manure incorporated with the soil at the bottom. Take the plants up carefully, remove all decayed portions, and plant a few at a time with a trowel, watering in as the work proceeds and allowing each plant a space of 5" or 6". If very hot weather ensues, a slight shading during the hottest part of the day will be beneficial. Successional trenches may be planted at intervals of three weeks or a month.

Earthing.—The earliest plants should be ready for a slight earthing-up in August, which should be carefully performed with a trowel, removing all suckers, and taking care that no soil falls into the heart of the plant. When ten days or a fortnight have elapsed another earthing may be given, using the spade to chop up the soil and the hands to gently mould it around the plants, leaving the centres still free to grow. Finally, in about

another fortnight, complete the earthing process, bringing the soil to a sharp slope, with only the tips of the tallest leaves visible. Some growers prefer to accomplish the earthing-up at one operation, and successful results are obtained in this way. Celery is generally fit for use a month or five weeks after the final earthing-up.

Celery Fly (*Tephritis Onopordinis*).—The larvæ of this fly mine beneath the surface of Celery leaves, and cause the well known blistered appearance by eating away the green colouring matter of the leaf. Crushing between the finger and thumb, and the removal of badly affected leaves, are recommended for its extirpation; while an occasional dusting over the leaves with soot and lime on dewy mornings is the means generally adopted to prevent the mature fly depositing its eggs on the foliage.



CELMISIA CORIACEA.

A Selection of Varieties :—

Leicester Red; very large.	Standard Bearer, red;
Major Clarke's Red;	large.
medium.	Sulham Prize, pk.
Sandringham White;	Wright's Giant White;
early, dwarf.	large.

CELMISIA.

A genus (*ord.* Compositæ) of greenhouse or hardy perennials, propagated by seeds and thriving in any fertile, well-drained soil.

Principal Species :—

coriacea, wh., yel.	Monroi, grh., yel.
Lindsayi, hdy., wh., yel.	spectabilis, My., hdy., lil., yel.

CELOSIA.

Description.—Although some thirty species are included in this genus (*ord.* Amarantaceæ), very few of them are cultivated. Cristata, the Cockscomb, and its varieties pyramidalis, p. plumosa, and variegata, are the most valuable members of the genus. All are showy plants, and much prized for decoration. For some time pyramidalis was regarded as a distinct species, but it is now looked upon as only a variety of the versatile cristata.

Propagation.—Seeds of all the species may be sown in brisk heat in February or March, the plants pricked-out singly into small pots, and grown on

briskly in rich soil, repotting always before the roots are through the bottoms of the pots, and seeing that the plants never experience a check in any way. A starving process is sometimes adopted with Cockscombs, the object being to cause combs to form prematurely, when the best-shaped ones are selected and placed in flowering pots. When cristata produces good combs on somewhat long stems, as is sometimes the case, procure pots a size smaller than the plants are in, crock well, and fill with sandy soil. Cut off the heads of the leggy plants with some 6" of stem attached, remove the lower leaves, and insert them singly in the centre of the prepared pots. Press the soil firmly around the stems, and place in a propagating case, or on a brisk, moist hotbed, when they will quickly emit roots and form beautiful dwarf plants with large combs in small pots. Pyramidalis and p. plumosa are very graceful plants for conservatory decoration. They should be grown in a moist atmosphere to discount the attacks of red spider, and be liberally fed until the colour of the flowers is seen, when pure water only should be given. They make extremely graceful and effective bedding plants if seeds are sown early in February and the plants are grown on well, carefully hardened off, and planted out in good soil in the beginning of June. If well grown and liberally fed they make magnificent objects in 8" or 10" pots, and will retain their beauty for many weeks. The plummy Celosias are obtainable in various colours, e.g. yellow, golden, crimson, scarlet, purple, and creamy white; or seeds may be purchased in packets containing a mixture of the whole. Cristata variegata has prettily variegated foliage. Seed is very sparingly produced on good Cockscombs, and where the different varieties are grown together they invariably produce hybrid monstrosities.

Principal Species and Varieties :—

argentea, 2' to 2½', st., sum., flowers wh. in dense spikes.

—linearis, narrower lvs. than the type.

cernua (*syn.* cristata).

cristata, 1½' to 3', st., sum., dark red, very variable (*syn.* cernua).

—coccinea, 1' to 2', st., sum., shorter lvs.

—comosa, 1' to 2', st., sum., red or pur.

—pyramidalis, 1½' to 2½', st., sum., red, yel. There are many sub-vars., of which plumosa is the most showy.

—variegata, 1½' to 2', st., sum., red, variegated foliage.

Huttoni, 1' to 2', st., sum., red, in small spikes. The crim. lvs. make this a handsome foliage subject.

CELSIA.

Hardy or half-hardy plants (*ord.* Scrophularinææ), which bear a close resemblance to the Verbascums or Mulleins, from which they differ little in structure. They have their flowers in spikes. Propagated by seeds sown under glass in spring; the shrubby species also by cuttings of the young wood in pots placed in a frame or greenhouse. The biennials must be wintered in a frame or greenhouse. Any common soil.

Principal Species :—

Arcturus, 4', Jy., hlf-hdy. shr., grh., yel. There is a var. named linneana, which has a pur. throat (*syn.* sublanata).

cretica, 4', Jy., hlf-hdy. bien., yel. Effective for flower borders in sum. and for pots in the grh. (*syn. Verbascum lyratum*).

Other Species :—

betonicaefolia, 2', Aug., bien., yel.	heterophylla, 4', Jy., hdy. bien., yel.
bugulifolia, 1', Jy., hdy. per., yel., br.	lanceolata, 3', Jy., hlf-hdy. bien., yel.
coromandelina, 4', Jy., st. ann., yel.	orientalis, 3', Jy., hdy. ann., br., yel.

CELTIS.

This genus (*ord. Urticaceæ*) includes hardy deciduous and stove evergreen shrubs and trees. They will thrive in any fertile soil, and may be propagated by seeds, layers, and autumn cuttings. Some of the hardy species are ornamental, but the tropical ones are of little value.

Principal Species :—

crassifolia (<i>see occidentalis</i>).	occidentalis, 20', Ap., grn.
davidiana, 20', Ap., grn.	— pumila, 8', Je., grn.

Other Species :—

Stove Evergreen :—

aculeata, 10', Je., grn.	australis, 30', My., grn.
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Hardy Deciduous :—

mississippiensis, 20', Ap., grn.	sinensis, 12', My., grn.
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CENIA.

A genus of about nine species of little-known plants (*ord. Compositæ*) of small garden value, related to *Anthemis*. The greater number are hardy annuals. The only one which has been in cultivation is *turbinata* (*syn. pruinosa*), which grows from 6" to 12" high, and has yellow or white flowers. Sandy soil.

CENTAUREA. (CENTAURY, CORNFLOWER, STAR THISTLE, and SWEET SULTAN.)

A large genus of hardy or half-hardy perennial, biennial, or annual flowers (*ord. Compositæ*), some of which are of no value, but many others of great beauty and effect in the garden, or useful for cut flowers. The favourite, *Cyanus*, the annual Cornflower, is of much value for bouquets, and other purposes for which cut blooms are in demand. Many of the tall perennials are prized for striking effect, and the varieties of *montana* are of great usefulness. Unless otherwise stated, those named are perennials and hardy; they include all the best in cultivation. The perennials are propagated by seeds or division; the annuals and biennials by seeds sown either in the open or in pans or boxes in slight heat, afterwards pricked out, and hardened off before planting outside. Any good garden soil. Some of the taller species for the border will need staking to prevent them from being blown down by the wind.

Principal Species :—

Annuals :—

Cyanus (Cornflower), 3', Jy., etc. An indispensable hdy. ann., of which there are a number of colours and shades, the bl. being as useful as any. There are dwarf strains, and others with semi-double flowers.

depressa, 1½', Jy., bl. Desirable on account of its habit being dwarfer than the preceding.

Moschata, 2', Jy., pur. The Sweet Sultan. There is a darker coloured var. known as *atropurpurea*, and a wh. called *alba*. Some consider the next

species a var. of *Moschata* (*syn. Amberboa Moschata*).

odorata, 1½', Jy., yel. The popular, sweetly scented Sweet Sultan. There is also a wh. var. sometimes known as *Margarita*.

Perennials :—

aurea, 2', Jy., yel. A pretty border plant.

babylonica, 6', Jy., yel. A conspicuous border or wild-garden plant.

Cineraria, 3', Jy., hlf-hdy., pur. Better known as *Cineraria candidissima*, and grown for its silvery foliage.

Clementi, 3', Jy., yel. An effective border plant.

dealbata, 2', Jy., pur. Neat and pleasing.

glastifolia, 4', Jy., yel. A tall per. of much character.

macrocephala, 4', Jy., yel. An effective plant for the border or the centre of a bed. Large Thistle-like heads of bright yel. flowers.

montana, 2', Jy., bl. A most valuable plant, of which there are vars. with wh., creamy wh., and red flowers.

Other Species :—

<i>alba</i> , 2', Jy., wh.	<i>orientalis</i> , 2½', Jy., pale yel.
<i>atropurpurea</i> , 3', Jy., pur.	<i>pulchra</i> , 1', Aug., hlf-hdy., pur.
<i>calceitrapoides</i> , 1', Je., pur.	<i>ragusina</i> , 2', Je., yel.; lvs. silvery.
<i>eriphora</i> , 1', Aug., yel.	<i>ruthenica</i> , 3', Jy., pale yel.
<i>gymnocarpa</i> , 1½', Aug., hlf-hdy., pur.	<i>rutifolia</i> , 3', Jy., red.
<i>Jacea</i> , 1½', Jy., pur.	

CENTOTHECA.

Indian Grasses (*ord. Gramineæ*), needing a stove temperature. *Lappacea* may be grown in loam and leaf mould, but it is of little horticultural value.

Principal Species :—

lappacea, 1½', Jy., ann., grn.

CENTRADENIA.

A small genus (*ord. Melastomaceæ*) of Central American evergreens that must be grown in the cool stove or intermediate house. They succeed well in fibrous peat and loam with coarse sand, and may be increased by cuttings inserted in sandy soil beneath a bell-glass over bottom heat during early spring.

Principal Species :—

<i>divaricata</i> , 1½', My., wh.	<i>inaequilateralis</i> , 1', Ap., ro. wh. (<i>syn. rosea</i>).
<i>floribunda</i> , 1½', Jy., pale red.	<i>ovata</i> , 1', My., pk.
<i>grandifolia</i> , 1½', Sep., pk.	

CENTRANTHUS. (VALERIAN.)

Effective hardy herbaceous or annual plants (*ord. Valerianæ*), which are useful for borders, rockwork, or old walls. The flowers are in rather large heads, and the perennial, *ruber*, is very showy. The annuals and perennials are propagated by seeds, sown either in the open ground or in a frame in March; the perennials by division in spring or autumn. If required on walls, the seeds should be sown in crevices and covered with a little stiff soil. Any common garden soil.

Principal Species :—

<i>macrostemon</i> , 2', Jy., bright red.	Jy., etc., red. A very effective hdy. per., of which there are several forms, including one— <i>albus</i> —with wh. flowers
<i>albus</i> has nice wh. flowers.	
<i>ruber</i> (Red Valerian), 2½',	(<i>syn. Valeriana rubra</i>).

Centauridium (*see Xanthisma*).

Other Species :—

angustifolius, 1½', Je., red. longiflorus, 2', Jy., per.,
 Calceitrapa, 1', Je., etc., red.
 hdy. ann., wh.

CENTRONIA.

A small genus (*ord.* Melastomaceæ) of ornamental shrubs, propagated by cuttings under a bell-glass, and thriving in a mixture of two parts of peat, one part of leaf mould and sand.

Principal Species :—

hæmantha, 8', grh., pur. red (*syn.* Calyptraria hæmantha).

CENTROPETALUM.

A most interesting little genus (*ord.* Orchidaceæ) of epiphytic Orchids from the mountains of tropical America. Not being so plentiful or showy as some Orchids, they are seldom met with in cultivation. An intermediate temperature and the usual compost of peat and sphagnum suit them.

Principal Species :—

distichum, 6'', sum., br. Warscewiczii, 6'', sum., brownish.

CENTROPOGON.

Effective stove and greenhouse plants (*ord.* Campanulaceæ) of much beauty and interest. Flowers like those of the Lobelia. The hybrid lucyanus is the most desirable. Propagated by cuttings of the young shoots (preferably with a heel) rooted in sandy soil under a bell-glass, with a bottom heat of not less than 60°; also by division. Sandy fibrous peat and loam. Grow in a cool stove or warm greenhouse until they come into bloom, when the plants may be placed in a house with a temperature of not less than 50°. After flowering, replace in their former quarters.

Principal Species :—

cordifolius, 2', Nov., ro. osus and Siphocampylus
 fastuosus, 2', Nov., ro. betulæfolius.
 lucyanus, 2', Nov., ro.; surinamensis, 2', Nov., ro.
 a hybrid between fastu- tovarensis, 2½', Oct., ro.

CENTROSEMA.

The few members of this genus (*ord.* Leguminosæ) are stove climbers with evergreen foliage, and may be propagated from seeds or cuttings and grown in any good, well-drained compost.

Principal Species :—

brasilianum, 4', Je., ro. Plumieri, 6', Sep., red, wh.
 habium hastatum. (*syn.* Clitoria Plumieri).

CEPHAËLIS (*syn.* CEPHALEIS).

A genus (*ord.* Rubiaceæ) of stove plants, from one species of which, Ipecacuanha, we get the well-known ipecacuanha of commerce. The plants grow well in a mixture of turfy loam, fibrous peat, and sand, and may be increased from cuttings in sand, under a bell-glass in bottom heat.

Principal Species :—

Ipecacuanha, 3', Jan., tomentosa, 4', aut., yel.,
 Mch., wh. (correctly Psycho- red (correctly Psycho-
 tria Ipecacuanha). tria tomentosa).

Other Species :—

alba, 3', Ap., pk. peduncularis, 2', Feb., wh.
 axillaris, 4', Ap., wh. purpurea, 1', My., pur.
 elata, 15', Je., pur. wh.
 glabra, 3', Ap., bl. Swartzii, 4', Ap., bl.
 involucreta, 5', Jy., wh. violacea, 1', Je., wh.
 muscosa, 4', My., wh.

Centrocapha (see *Rudbeckia*).

Centroclinium (see *Onoseris*).

Centrosolenia (see *Episcia*).

Centrostemma (see *Hoya*).

CEPHALANTHERA.

Terrestrial Orchids (*ord.* Orchidaceæ), all natives of Great Britain, and consequently quite hardy; but the genus is also represented in other countries. They are, however, difficult to establish in gardens, unless removed while at rest and planted in a mixture of peat and loam.

Principal Species :—

eusifolia, 2', Je., wh. rubra, 1½', My., Je., pur.,
 pallens, 1½', My., Je., wh. wh
 yel. (*syn.* grandiflora).

CEPHALANTHUS. (BUTTON WOOD.)

North American and South African hardy or tender, deciduous or evergreen shrubs (*ord.* Rubiaceæ). The only hardy species readily available is occidentalis, which is about 7' high, and has whitish flowers at the ends of the branches in July and August. It is propagated by layers, and also by cuttings under glass in autumn. It grows in common soil, but likes that which is moist and peaty.

Principal Species :—

natalensis, 2', spr., grh., red, grn.

CEPHALARIA.

Hardy annual or perennial herbs (*ord.* Dipsacæ), of rather coarse and ungainly habit; hence suitable rather for the wild garden than the herbaceous border. They may be easily raised from seed, sown either when it is ripe or in spring outdoors. Any ordinary soil will do.

Principal Species :—

alpina, 5', Je., Jy., pale yel. tartarica, 5' to 6', sum.,
 (*syn.* Scabiosa alpina). per., yel.

Other Species :—

leucantha. syriaca. transylvanica.

CEPHALOTAXUS.

Pretty, Yew-like evergreen Coniferous shrubs or trees (*ord.* Coniferae), which may advantageously be used in gardens and pleasure grounds. Several species have been described, but, according to the "Manual of the Coniferae," they are not differentiated by very definite characters. In this country they seldom exceed 20' in height, and the stature named below is that usually attained. Propagated by seeds, sown in spring, or by cuttings in sandy soil in a cold frame in August or the following month. Almost any well-drained soil.

Principal Species :—

drupacea, 5', lvs. grass grn., fruit over 1" long, chestnut br.

Fortuni, 8', lvs. dark grn., fruit more than 1" long, dull br. The *Index Kewensis* refers it to drupacea.
 pedunculata, 8', lvs. larger and darker than those of drupacea, fruit on a short stalk (*syn.* Taxus harringtoniana). The vars. fastigiata and sphaeralis are grown, the former being very peculiar and interesting (*syns.* of fastigiata, Taxus japonica and Podocarpus koraiensis).

CEPHALOTUS.

A dwarf-growing, pitcher-bearing plant (*ord.* Saxifragæ) from King George's Sound. It is a most interesting plant, and might well find a place in every greenhouse. It is a herbaceous perennial, and may be multiplied from offsets. The compost may consist of chopped sphagnum and fibrous peat, intermixed with potsherds. The pots or pans must be perfectly drained, and careful watering is

essential. It is frequently found advantageous to cover the plants with bell-glasses.

Only Species :—

follicularis, 2', Ap., wh.

CERASTIUM. (MOUSE-EAR CHICKWEED.)

A large genus of dwarf plants (*ord.* Caryophyllæ), many of which are mere weeds, but a few of which are of considerable value for edgings, rockwork, or walls because of their pretty white flowers and silvery or grey leaves. Only the best are named below. Propagation is by seeds sown in spring in a frame or in the open ground, by cuttings under a hand-light in spring, or by division of large plants. A light, sandy soil is the most suitable, although they can be grown in common soil. Young plants ought to be carefully protected from slugs, which are very fond of them.

Principal Species :—

alpinum, 4", Je., wh. A pretty native species.

Biebersteinii, 6", My., Je., wh. This and *tomentosum* are among the very best for the garden. Flowers large, lvs. quite wh.

Boissieri, 9", Je., wh., silvery lvs. and good sized flowers.

grandiflorum, 6", Jy., wh. Rather coarser, and only adapted for trailing over rockwork.

tomentosum, 6", My., etc., wh. The best known, largely grown for its wh. foliage and flowers.

CERASUS. (CHERRY.)

The Cherries (*ord.* Rosacæ) are now included by modern botanists with *Prunus*, but are so generally known in gardens as *Cerasus* that it is more convenient to deal with them under this name. The varieties of the fruiting Cherry will be found under CHERRY. The greater number of those now referred to are handsome trees or shrubs suitable for the garden or for decorative planting. The double-flowered Cherries are very beautiful. Propagated by seeds sown in beds in autumn or spring, by cuttings in autumn or early winter, and by grafting and budding. Any good, rather sandy soil. Some of the smaller Cherries are very suitable for forcing in gentle heat. The double *Pseudo-cerasus*, also known as *Watereri* and *Sieboldii rubra*, is one of the best for this purpose.

Principal Species and Varieties :—

Avium, the Wild Cherry or Gean, 40', Ap., My. There are several valuable forms of this, that called *flore pleno* or *multiplex* having double flowers; *juliana*, bluish ones; *pendula*, a drooping habit; and *laciniata*, cut lvs. (*syns.* *domestica*, *dulcis*, *nigra*, and *sylvestris*, correctly *Prunus Avium*).

Cerasus, the Common Cherry, 20', Ap., wh. There are several vars. of much beauty, that called *Rhexii*

Ceradia (see *Othonna*).

fl. pl. (*syns.* *caproniana multiplex*, *ranunculiflora*, etc.) being very fine (correctly *Prunus Cerasus*).

Laurocerasus, the common Laurel, 10', Ap., wh. A favourite ev. shr., the following being among the best of its forms: *rotundifolia*, *caucasica*, *colchica* (free-blooming), and *latifolia*. The var. *schipkaënsis* is very hdy. (correctly *Prunus Laurocerasus*).



Photo: C. R. Bick.

CERASUS (CORRECTLY PRUNUS) AVIUM PENDULA.

lusitanica, the Portugal Laurel, 20', Je., wh. Another well known ev. shr., and one much admired when in bloom. *Myrtifolia* is a pretty form, with smaller lvs. (correctly *Prunus lusitanica*).

Mahaleb, 10', Apl., wh. This and its silver-variegated form, *variegata*, are worth growing (correctly *Prunus Mahaleb*).

Padus, the Bird Cherry, 12' to 30', Ap., wh. The forms of this are rather numerous, but *argentea* and *rubra* are both good (correctly *Prunus Padus*).

Pseudo-cerasus, 10', Ap., wh. or bluish. This is useful for forcing, and beautiful in the garden as well (*syns.* *Sieboldii rubra* and *Watereri*, correctly *Prunus Pseudo-cerasus*).

serrulata, 12', Ap., ro. or wh. Handsome double flowers (correctly *Prunus serrulata*)

Other Species :—

acida, 20', My., wh. (correctly *Prunus acida*).
 caroliniana, 25', My., wh. (*syns.* *Laurocerasus caroliniana* and *Padus caroliniana*, correctly *Prunus caroliniana*).

Chamaecerasus, 4', My., wh. (*syn.* *fruticans*, correctly *Prunus Chamaecerasus*).

Chicasa, 7', My., wh. (correctly *Prunus angustifolia*).

depressa, 5', My., wh. (correctly *Prunus pumila*).
 ilicifolia, Mch., ev., wh., tender (correctly *Prunus ilicifolia*).

japonica (correctly *Prunus japonica*).

pennsylvanica, 30', My., wh. (*syn.* *borealis*, correctly *Prunus pennsylvanica*).

salicina, 5', Ap., wh. (correctly *Prunus salicina*).

virginiana, 30', My., wh. (correctly *Prunus virginiana*).

CERATIOLA.

A little-grown, half-hardy, Heath-like shrub (*ord.* Empetraceae), of evergreen habit and producing brownish flowers in June, followed by yellow berries. The needle-shaped leaves are about $\frac{1}{2}$ " long and generally close together. It likes sandy peat soil, and is propagated by cuttings placed in slight heat, with a bell-glass over them.

Only Species :—

ericoides, 2', Je., br.

CERATOLOBUS.

A small genus (*ord.* Palmæ) of slender, graceful Palms, seldom grown but very beautiful, glaucescens being especially useful as a table plant. They require a stove temperature and a good compost of loam and peat.

Principal Species :—

concolor, 6'. glaucescens, 10'. lvs. up to 2' long.

CERATONIA.

This evergreen tree (*ord.* Leguminosæ) has great economic value in the lands to which it is indigenous. It produces brown pods of sweet mealy matter, which has medicinal properties. They are eaten largely with a view to improving the voice, and also used in the preservation of other fruits. The horses of the British army were fed upon them in the Peninsular War. They have been called the St. John's Bread, from the supposition that they were the locusts upon which St. John the Baptist fed in the wilderness. They are also supposed to be the "husks" of which the prodigal son was obliged to eat. The seeds are said to have been the original carat weights used by jewellers. The tree succeeds best in the greenhouse, but is hardy in favoured localities. It thrives best in fibrous loam and sand, and may be propagated from cuttings of ripe wood in sandy soil under a bell-glass.

Only Species :—

Siliqua, 15', Sep., yel., red. (The Carob.)

CERATOPETALUM.

These are the red gum trees (*ord.* Saxifragæ) of New South Wales, and should be grown in rich loam and sand in the greenhouse. Cuttings root readily in sandy soil under a bell-glass.

Ceratochilus of Blume (see *Saccolabium*).

Ceratochilus of Lindley (see *Stanhopea*).

Ceratodaetilis (see *Llavea*)

Principal Species :—

gummiferum, 60', Jy., yel.

CERATOPTERIS.

A most remarkable aquatic Fern (*ord.* Filices), an annual, or at most biennial. It is best grown in good loam, the pot being wholly submerged in a tank of warm water in a stove temperature. There is no difficulty in propagating the species, either from spores or by means of the young plants that form on both fertile and unfertile fronds. It is an elegant and distinct Fern, popularly known as the Water Elk's Horn.

Only Species :—

thalictroides, 2 $\frac{1}{2}$ ', fronds bright grn.

CERATOSTEMA.

These greenhouse evergreen shrubs (*ord.* Vacciniaceæ) thrive best in peat and sand, and may be propagated by cuttings inserted in sandy soil beneath a bell-glass.

Principal Species :—

hirsutum, 4', My., sc. speciosum, 3', Je., red,
 longiflorum, 3', My., crim. yel.

CERATOSTIGMA.

An obscure genus of greenhouse or hardy perennial herbs or shrubs (*ord.* Plumbaginæ). The species mentioned below is the only one of note; it will grow in any fairly good garden soil, and may be increased by root division.

Principal Species :—

plumbaginoides, 1', Oct., hdy., vio. (*syn.* *Plumbago Larpentæ*).

CERATOTHECA.

The species in cultivation is a half-hardy annual (*ord.* Pedalineæ), but it is best grown in the greenhouse, unless a favoured position can be afforded out of doors. It is raised from seeds, and prefers a sandy loam.

Only Cultivated Species :—

triloba, 3', Sep., vio., bl.

CERBERA.

Stove shrubs and trees (*ord.* Apocynaceæ), thriving in fibrous loam and leaf mould. Cuttings in sand under a bell-glass over bottom heat root with proper care. Some are poisonous.

Principal Species :—

Odollum, 20', Jy., wh. Tanghin, 20', Je., pk.

CERCIDIPHYLLUM.

In the south of England and Ireland this shrub (*ord.* Magnoliaceæ) is hardy, but in cold districts it should have greenhouse protection. Propagation by cuttings.

Only Species :—

japonicum, 5', sum., grn.

CERCIS. (JUDAS TREE.)

Singularly pretty hardy deciduous trees (*ord.* Leguminosæ), which are less frequently grown than they deserve. They are suitable for either the garden or the shrubbery, and are of much effect with their branches crowded with flowers before the leaves appear. They are raised from seeds sown in sandy soil in March or April, or by layers.

Principal Species :—

canadensis, 15', My., red. pur., blush, or wh. The
 chinensis, 10', My., pk. most common, but need-
 (*syn.* *japonica*). ing a wall in very cold
 Siliquastrum, 25', My., localities.

CERCOCARPUS.

A small genus of cool greenhouse evergreen shrubs (*ord.* Rosaceæ). They grow best in a compost of peat and loam, with coarse sand, and may be increased by cuttings in sand under a bell-glass in a moderate heat.

Principal Species :—

fothergilloides, 10', My., pur.
parvifolius, hlf-hdy., Je., shr.

CEREUS. (TORCH THISTLES.)

Description.—A very large genus (*ord.* Cactaceæ). The plants are found exclusively in the New World, and vary in height from the giant Saguaro (*giganteus*), which often attains to 80' or more, to the diminutive *Cereus flagelliformis*, the Rat-tail Cactus. Many species produce edible buds or fruits, notably *splendens*, *repandus*, and *triangularis*. The latter is named the Strawberry Pear, and its fruits are much appreciated in the West Indies, where it is cultivated. One section of *Cereus*, represented by *grandiflorus*, *Macdonaldiae*, and *nycticalus*, produce their flowers only during the evening hours, generally expanding from seven o'clock until twelve, and closing them to open no more before the morning. The flowers of *grandiflorus* are among the largest produced by any known plant, being often 1' in diameter, pure white, and possessed of a most powerful and delicious fragrance. This and *Macdonaldiae* are well worth the attention of anyone possessing a warm house, and as they may be trained to a wall, or round a pillar, little space will be sacrificed to their accommodation. Among dwarfier growing species *speciosissimus* and *fulgidus* should on no account be overlooked, for the bright scarlet flowers, with their myriads of white anthers, are very beautiful. The section of which *flagelliformis* is the type make excellent basket plants, or may be suspended in pots, and will thrive in any cool plant house; in fact, it is no uncommon thing to see really good specimens flowering bravely in cottage windows, where they are objects of considerable interest.

Propagation is easily effected in early summer by inserting portions of the ripened leaves or stems in sandy soil, and giving them a warm, moist atmosphere to root in.

Other Cultural Points.—The cultivation of *Cereus* is simple in the extreme, and consists in supplying abundance of water during the growing season; the plants being well exposed to light, air, and sunshine; and the gradual reduction of the supply during autumn when growth is finished; until, with the cold, dull days of winter, watering is discontinued entirely, and the soil allowed to become almost dust dry. Thoroughly drain the pots employed with broken crocks and pieces of charcoal, pot the plants firmly in a mixture of sandy loam, old mortar rubbish, and broken bricks, adding more sand and small lumps of charcoal if any doubts are entertained as to the soil's complete porosity. The plants may remain in the same pots for several years, with benefit to themselves and their grower. Frequent disturbance, and potting in loose, rich, highly-manured soil, are fatal to free flowering, and must be avoided.

Principal Species :—

aggregatus, Sep., sc.
coccineus (*see aggregatus*).
flagelliformis, Mch. to My., pk.
fulgidus, Je., sc.
grandiflorus, Jy., wh., night flowering.
grandispinus, sum., ro.
lividus, 30', wh.
Macdonaldiae, Jy., wh., red sepals (*see figure*).
nycticalus, wh., night bloomer.
pentagonus, 3', Jy., wh.
pleiogonus, 6', reddish pur. (correctly *Echinocereus leeanus*).
serpentinus, 3', pur., wh.; creeping.
speciosissimus, 3' to 6', Jy., sc.
triangularis, 1' to 2', Jy., grh., wh.

CERINTHE. (HONEYWORT.)

A genus of hardy plants, principally annuals (*ord.* Boraginæ), of little value for the garden, though major is sometimes grown as a bee plant. They grow in common soil and in sunny positions. Seeds are sown in spring.



Photo: D. S. Fish, Edinburgh.

CEREUS MACDONALDIÆ.**Principal Species :—**

major, 1', Jy., yel. minor, 1', Jy., yel.

CEROPEGIA.

This genus (*ord.* Asclepiadæ) comprises stove and greenhouse climbers, twiners, and shrubs, and is not of any great horticultural merit. Propagation may be effected in spring by cuttings inserted in sand beneath a bell-glass in bottom heat. A good compost will consist of loam, leaf mould, fibrous peat, and sand.

Principal Species :—

elegans, 4', Aug., wh., br., pur.
Monteroea, 3', Jy., grn., pur. br.
Sandersoni, 3', Oct., grh., grn.
Woodii, 3', Jy., st., wh., pur., ev.

Other Species :—**Stove :—**

acuminata, 2', Je., pur.
africana, 6', Jy., yel. (ev. twiner).
bulbosa, 2', My., grn., red.
cumingiana, 4', Aug., yel., br.
Gardneri, 4', My., wh., br. (ev.).
juncea, 1', Aug., yel.
Lushii (*see bulbosa*).
oculata, 6', Aug., spotted.
Thwaitesii, 3', Sep., grn., red.
tuberosa, 8', My., grn., red.
Wightii, 5', Aug., grn., pur.

Greenhouse :—

australis, 3', Je., wh.
Barklyi, 3', Je., wh., pk.
Bowkeri, 2', My., grn., yel.

CEROXYLON.

This is a small genus of stove Palms (*ord.* Palmæ), the wax of which is used by the people of New Grenada in candle making. Plants are raised from seeds, and grown in good loam.

Principal Species :—

andicolum, 50'. About 8' in this country.

CESPEDESIA.

Small trees (*ord.* Ochnaceæ), natives of America, which should be grown in the stove. They succeed best in a compost of fibrous loam and peat, with sand and charcoal to ensure porosity, and may be propagated from cuttings in sandy soil beneath a bell-glass over bottom heat.

Principal Species :—

Bonplandii, 6', sum., or. yel.

CESTRUM.

This genus (*ord.* Solanaceæ) is well known to most horticulturists by the name of Habrothamnus. It comprises half-hardy, greenhouse, and stove plants, some of which are very handsome. The berries of all the species are poisonous, and what economic value the genus possesses lies in the dye that is manufactured from tinctorium. As pillar or wall plants in a greenhouse or conservatory many are extremely beautiful. The culture is easy, and they will grow in any soil, though a mixture of loam and peat is most suitable. Propagation is easily effected by cuttings. A severe annual pruning is necessary after flowering.

Principal Species :—

aurantiacum, 5', Je., Newellii, 10', Je., grh.,
warm grh., or. yel. crim.
elegans, 10', Jan., Mch.,
grh., car.

Other Species :—

alternoides, 4', Mch., st., odontospermum, 6', Sep.,
pale yel. st., wh.
angustifolium, 6', Je., st. Parqui, 6', Je., grh., pale
bracteatum, 7', Ap., st., yel.
grn. pendulinum, 5', Ap., st.,
wh.
diurnum, 8', Nov., st., roseum, 5', Jy., grh., ro.
wh. salicifolium, 4', My., st.,
Endlicheri, 5', Mch., grh., striped.
ro. suberosum, 5', Je., st.,
fasciculatum, 6', Mch., sulphur.
grh., crim. tinctorium, 4', My., st.,
fastigiatum, 4', Nov., st., wh.
wh. vespertinum, 6', Je., st.,
latifolium, 6', Je., st., wh. grn., wh.
laurifolium, 6', Jy., st., Warscewiczii, 5', Nov.,
yel. grh., or. yel.
nocturnum, 7', Nov., st.,
wh.

CETERACH (see ASPLENIUM).**CHÆNACTIS.**

Rather showy plants (*ord.* Compositæ), of which there is only one species in cultivation in this country. This is tenuifolia, which grows 9" or 12" high, and has yellow flowers in summer. Its hardiness is doubtful, and it ought to be kept in a frame in winter. Seeds should be sown in a frame or greenhouse in early spring. Sandy soil.

CHÆNOSTOMA.

This Cape genus (*ord.* Scrophularinæ) com-

Croton aurata (see *Rose enemies*).

Chabrea (see *Leuceria*).

Chenanthus (see *Dialanium*).

Chenesthis (see *Lochroma*).

prises one annual species, which is raised from seeds sown in boxes or pots in the ordinary manner, and planted out of doors when the weather is favourable; and a number of herbaceous perennial species, which are increased by cuttings in late summer, and can also be employed for summer bedding. Most of the species have been grown under the generic title of Manulea.

Principal Species :—**Annual :—**

fœtidum, 1', Je., wh.

Perennials :—

cordatum, 1', Je., wh.

hispidum, 1', Jy., wh.

linifolium, 1', Je., wh.

polyanthum, 1', Je., yel.,
lil.

CHÆROPHYLLUM.

Interesting hardy plants (*ord.* Umbelliferae), mostly annual or biennial. They may be raised from seed sown either in a cold frame or in the open ground. Ordinary garden soil will suit them.

Principal Species :—

aromaticum, 3', Jy., wh. villosum, 2', Jy., wh.

CHÆTANTHERA.

There are only a few species in this genus (*ord.* Compositæ) of Chilian plants. They are herbaceous perennials, thriving best in the cold greenhouse in a mixture of loam and peat. Propagate by division early in the year.

Principal Species :—

chilensis, 1½', Jy., yel.

*ciliata, 2', Jy., yel.

linearis, 1½', Jy., ann.,

yel.: raised from seeds.

tenuifolia, 1½', Jy., yel.

CHÆTOCALYX.

These stove evergreen twiners (*ord.* Leguminosæ), which came from St. Vincent, thrive in a compost of loam and peat or leaf mould, and may be propagated from cuttings inserted in sandy soil under a bell-glass.

Principal Species :—

vincentina, 6', Je., yel. (*syn.* Glycine vincentina).

CHAILLETIA.

These shrubs (*ord.* Chailletiacæ) are found chiefly in tropical South America. One species, toxicaria, comes from Sierra Leone, and its poisonous seeds are used as rat poison. Under cultivation stove treatment is necessary to ensure strong growth, but a warm greenhouse will suit during most of the year. Propagation by cuttings; use peat and loam for potting.

Principal Species :—

pedunculata, 30', sum., toxicaria, 5', Je., wh.
wh.; cl.

CHALK.

From a gardener's point of view, chalk (carbonate of lime) is valuable because of the power it has of neutralising the acidity of wet, sour soils, thus rendering them fertile, but it must be remembered that even in this respect lime is more valuable than chalk, for the latter, when pure, contains a little more than half its bulk of lime. For the bottoms of walks and for the formation of drains, in place of tiles or faggots, chalk is useful. Not a few plants are benefited by having lime in the soil, but where this is not readily obtainable chalk may be substituted.

Chaetogastra (see *Tibouchina*).

Chaff Flower (see *Alternanthera*).

CHAMÆBATIA.

This Californian evergreen shrub (*ord.* Rosacæ) is half-hardy in this country. It prefers a mixture of loam, leaf mould, and coarse sand. Propagation may be effected by cuttings.

Only Species :—

foliolosa, 3', sum., wh. (correctly *Spirea Millefolium*).

CHAMÆCYPARIS. (WHITE CEDAR.)

The dwarf Coniferous shrubs called Chamæcy-

Principal Species :—

*elatio*r, 9', grn.

elegans, 10', grn.

gracilis, 10', grn., wh.

Other Species :—

arenbergiana, 6', cream.

Ernesti - Augusti, 10',

grn., yel.

formosa, 10', grn.

fragrans, 7', wh.

geonomæformis, 8', grn., wh.

glaucifolia, 8', grn.

lindeniana, 10', grn., wh.

pulchella, 4', yel., grn.

schiediana, 8', grn., wh.

Tepejiloti, 10', grn., yel.



Photo: Cassell & Company, Ltd.

CHAMÆROPS HUMILIS (*see p. 197*).

paris are now classed with Cupressus, which see for the plants grown by a few persons under this name.

CHAMÆDOREA.

An extensive genus (*ord.* Palmæ) of handsome Palms. They require the temperature of a stove, and succeed in a soil of which sound loam forms the basis, with coarse sand. Propagation, by seeds sown when procurable in thumb pots, and shifted as necessary.

Chamæcerasus (*see Lonicera*).

Chamæcistus of S. F. Gray (*see Loiseleuria*).

Chamæcladon (*see Homalomena*).

CHAMÆLAUCIUM.

Coming from Western Australia, these evergreen shrubs (*ord.* Myrtacæ) require greenhouse treatment, and when well grown form handsome ornaments to that structure. Provide a compost of two parts of loam to one part of peat or leaf soil, with sand, and increase the stock by cuttings of half-ripened growths in sandy soil under a bell-glass.

Principal Species :—

ciliatum, 3', My., wh.

CHAMÆLIRIUM.

Dwarf, hardy plants (*ord.* Liliacæ) that like

Chamæfistula (*see Cassia*).

moist but well-drained situations. All are herbaceous perennials from North America, and are multiplied best by division. An interesting genus.

Principal Species :—

carolinianum, 6", My., Je., pale yel. (*syn.* luteum). luteum (*see* carolinianum).

CHAMÆPEUCE.

Thistle-like plants (*ord.* Compositæ) generally included with *Cnicus*, but here spoken of by their garden name. They are handsome, and much valued for bedding and sub-tropical gardens. Those named are half-hardy biennials, with the exception of *Sprengeri*, which is a hardy perennial. Propagated by seeds sown in moderate heat in February or March, also in autumn, the young plants being kept under glass in winter and planted out in May. Common garden soil.

Principal Species :—

Casabonæ (Fish-bone handsome wh. lines and Thistle), 2½, Jy., pur. spines on the grn. lvs. Effective. Sprengeri, 2', Jy., wh. diacantha, 3', Jy., pur., stricta, 2', Jy., pur.

CHAMÆRANTHEMUM.

This genus of Brazilian plants (*ord.* Acanthaceæ) requires the temperature of the stove. A compost of peat and loam is excellent, and drainage must be perfect. Cuttings root readily in sand or sandy soil under a bell-glass over bottom heat. The plants have pretty leaves.

Principal Species :—

argenteum, 1', sum., sil- igneum, 1', aut., yel. very leafage. pictum, 1', aut., or. and Beyrichii, 1', sum., wh. silver veined foliage.

CHAMÆRHODOS.

Beautiful perennial Alpines (*ord.* Rosaceæ), with flowers resembling those of the Strawberry. They are hardy, but must be kept very dry above at all times, and wintered in a dry frame. Sandy soil; and propagated by seeds sown in frame.

Principal Species :—

erecta, 6", Jy., wh. grandiflora, 6", Jy., wh.

CHAMÆROPS.

These dwarf Palms (*ord.* Palmæ) are so hardy, compared with many members of this wonderful order, that they have become very popular for home, greenhouse, and conservatory decoration, while in the south of England and Ireland, and even farther north, *humilis*, the only native European Palm, will grow out of doors with little or no protection, even in winter. The species do not flower until they have attained some considerable age; and this may account for the fact that the Palm so long known in gardens as *Chamærops Fortunei* or *excelsa* has been referred to *Trachycarpus*. The *Chamærops* are fan-leaved Palms, with the margin cut into pointed divisions; many of the species produce suckers freely, and may be propagated by division, while all are remarkable for the tough fibre surrounding the trunk at the bases of the leaf stalks. A warm greenhouse or intermediate temperature will suit; loam, leaf soil, and sand make a good rooting medium; seedlings are readily raised in heat.

Principal Species :—

gracilis, 10'. *humilis*, 10'. This popular Palm (*see p.* 196) shows a considerable amount of variation, and to those that show a marked difference in leaf forma-

tion, colour, or construction of fruit, such varietal names as *bilaminata*, *dactylocarpa*, *elegans*, *macrocarpa*, and *tomentosa* have been given.

CHAMELUM.

Rare half-hardy perennials (*ord.* Iridææ), with yellow flowers and narrow leaves. Practically the only one cultivated is *luteum*, which grows about 3" high. Dry, sandy soil, in a frame. Other species, *andinum*.

CHAMISSOA.

A small genus (*ord.* Amarantaceæ), mainly composed of stove annuals. They are raised from seeds sown in sandy soil in spring; the resultant plants thrive in any rich material.

Principal Species :—

altissima, 5', Jy., yel. A propagated from cuttings in very sandy soil st. ev. shr. that grows beneath a bell-glass best in fibrous loam over bottom heat. and is over bottom heat.

CHAPTALIA.

Interesting American herbaceous plants (*ord.* Compositæ), principally requiring greenhouse or other winter protection. *Tomentosa*, 6", May, white, half-hardy perennial, is the only one in cultivation. Division after flowering. Sandy soil. Other species: *albicans*, *dentata*, *exscapa*, *lyrata*, and *rotundifolia*.

CHARCOAL.

Almost all plants are benefited by charcoal, while for the prevention and checking of fungoid growths it is invaluable. It makes excellent drainage for pot plants, and may be washed and used repeatedly. Broken into nodules the size of Beans, it ensures sweetness in soils which have to remain a long time in the same pot owing to the slow growth of the plant. For Orchids it is essential, as, owing to the amount of water these receive, the compost they are grown in would quickly become sour and injurious were it not for the antiseptic qualities of the charcoal. Dusted around the collar of Melons in frames, it frequently checks or prevents the dreaded canker. It forms, when powdered, a beneficial dressing to all wounded or cut plant tissues, and may usefully be dug into soil which is infested with club, or other fungi, at the rate of a peck to the square rod, before the crop is planted.

CHARDINIA.

A neat hardy annual (*ord.* Compositæ) for the border, or useful for cut flowers to dry for winter. The species grown is *xeranthemoides*, 1', July, white, which is grown from seeds sown in the open in May, or in a frame in April. Common soil (*syn.* *Xeranthemum orientale*, also *C. macrocarpa*). Other species, *cylindrica* (now *Xeranthemum cylindraceum*).

CHARIEIS.

A pretty hardy annual (*ord.* Compositæ), the only species in cultivation being *heterophylla*, 1', June, blue (*syn.* *Kaulfussia amelloides*), which may be sown in a greenhouse or on a hotbed in March, or in April in the open. The variety *atrocærulea* has darker flowers. Common soil.

Chamænerion (*see* *Epilobium*).

Chamorchis (*see* *Herminium*).

Champignon (*see* *Mushroom*).

Chard (*see* *Artichoke*).

Charles's Sceptre (*see* *Pedicularis Sceptrum-Carolinum*).

CHARLOCK.

A well-known native plant (*Brassica Sinapistrum*, *ord.* *Cruciferae*). It is very nearly related to the Mustard and Turnip, which relationship makes it a source of danger in gardens where seeds of these, or other Cruciferous plants, are saved from selected stocks, as, should their period of flowering coincide with that of the Charlock, some very undesirable hybrids might be the result. In some rural districts the young tops of the Charlock are cooked and eaten as "greens." A solution of sulphate of copper at the rate of 1 oz. per gallon of water has been found useful for killing it.

CHEILANTHES.

Description.—Now including *Adiantopsis*, *Aleu-riopteris*, *Allosorus* (in part), *Myriopteris*, *Pleco-sorus*, *Physapteris*, and *Schizopteris*. A genus



Photo: Cassell & Co., Ltd.

CHEILANTHES
FARINOSA
VAR. ANCEPS.

Photo: Cassell & Co., Ltd.

CHEILANTHES
TENUIFOLIA.

(*ord.* *Filices*) of over sixty species of very elegant Ferns, distributed over temperate and tropical regions.

Propagation.—By spores, which germinate quickly and with considerable certainty if placed amid consistently humid surroundings.

Soil.—Equal parts of fibrous loam and peat, with sand, and a few pieces of charcoal and sandstone.

Other Cultural Points.—Cheilanthes are commonly regarded as being difficult to grow, and this is so when placed amongst a general collection of plants. Most of the species and varieties are either woolly or covered with a fine powder, and they detest having their fronds sprinkled with water. They should be given a place on a shelf near the glass in either the stove or greenhouse. Watering must at all times be carefully performed, for if the plants are allowed to become dry the pinnules curl up and the fronds die, the death of the whole plant

Chascanum (see *Bouchea*).

usually following. Stagnant moisture is equally fatal, and many a good plant is lost in winter in this way. The pots should be half filled with crocks. The most troublesome insect pests are snowy fly and thrips. The remedy is slight preventive fumigations with tobacco paper, or vaporising. Slugs will also give trouble unless the pots are stood upon crushed coke or sifted ashes, over which the little pests do not care to crawl.

Principal Species and Varieties :—

[NOTE.—The figures next to the specific or varietal name denote the length of the fronds.]

argentea, 5' to 8", grh., covered with wh. powder.
Clevelandii, 4' to 12", sub-hdy.
farinosa, 3' to 12", st., much cut, powdery.
— *anceps* (see figure).
fragrans, 2' to 4", hlf-hdy. (*syns.* *odora* and *suaveolens*).
gracillima, 4' to 12", grh.
lanuginosa, 4' to 8", hdy., densely woolly (*syn.* *gracilis*).
microphylla, 4' to 12", st. There are many vars., of which *micro-mera* is one of the best.
myriophylla, 4' to 9", st. — *elegans*, 4' to 9", much cut, very handsome.
radiata, 9' to 18", st., pinnae rayed (*syn.* *Adiantum radiatum*).
rufa, 6' to 9", st., under surface powdery.
tomentosa, 6' to 12", covered with thick wool (*syn.* *Bradburii*).
vestita, 4' to 12", sub-hdy.

Other Species and Varieties :—

aurea, 4' to 7", st. (*syns.* *C. borsigiana* and *Aleu-riopteris aurea*).
borsigiana (see *aurea*).
Bradburii (see *tomentosa*).
californica (see *Hypolepis californica*).
candida (see *Nothochlaena sulphurea*).
capensis, 4' to 7", grh.
chlorophylla, 1' to 1½', grh. (*syn.* *Hypolepis spectabilis*).
cuneata, 1' to 1½', grh., stripes red when young (*syn.* *rufescens*, of gardens).
dicksonioides (see *Hypolepis tenuifolia*).
Eatonii, 3' to 8", grh.
elegans (see *myriophylla elegans*).
ellisiana (see *hirta ellisiana*).
ferruginea (see *Nothochlaena ferruginea*).
Fendleri, 3' to 6", grh.
flexuosa, 4' to 8", st. *fragilis*.
frigida (see *lendigera*).
gracilis (see *lanuginosa*).
hirta, 4' to 12", grh. — *ellisiana*, broader fronds than the type.
lendigera, 4' to 12½", st. (*syn.* *frigida*).
Lindheimeri, 3' to 9", grh.
multifida, 5' to 15", grh.
mysurensis, 3' to 12", st., close to *fragilis*.
odora (see *fragrans*).
preissiana (see *Sieberi*).
profusa (see *Pellaea involuta*).
pteroides, 12' to 18", grh.
pulveracea (see *Nothochlaena sulphurea*).
rufescens (of gardens, see *cuneata*).
Sieberi, 5' to 10", grh. (*syn.* *preissiana*).
suaveolens (see *fragrans*).
tenuifolia, 4' to 12", st. (see figure).
viscosa, 6' to 9", st.
Wrightii, 3' to 5", grh.

CHEIRANTHERA.

These small shrubs (*ord.* *Pittosporae*) come from New South Wales, and flourish best in well-drained, light, rich loam and leaf mould, in the greenhouse. They are easily increased from cuttings in sand or very sandy soil, under a bell-glass.

Principal Species :—

linearis, 4', Oct., bl.

CHEIRANTHUS (see also WALLFLOWER).

Valuable perennial or biennial hardy or half-hardy flowers (*ord.* *Cruciferae*), best known from Cheiri, the common Wallflower, in its varieties. The species named are well adapted for the border, rockery, or walls. Propagated by seeds sown in the open or in cold frames; or by cuttings in

Cheimatobia brumata (see *Apple Enemies*).

summer or autumn under a glass or hand-light and kept slightly shaded until rooted. Common soil, but longer-lived on a dry one.

Principal Species :—

alpinus, 9", My., yel. A pretty rockwork plant, generally short-lived except on a dry soil.
 Cheiri, common Wall-flower, *see*.
 Marshallii, 1', My., or. A garden hybrid; very effective.
 mutabilis, 1', Ap., pur.; rather tender (*syn.* Allionii).

Other Species :—

arboreus, 3', My., hlf-hdy., yel.
 asper, 1½', Je., hlf-hdy., yel. (*syn.* capitatus).
 scoparius, 3', Je., hlf-hdy., wh., pur.
 semperflorens, 2', My., hlf-hdy., wh.
 tenuifolius, 2', Je., hlf-hdy., yel.

A number formerly known as Cheiranthus are now in Erysimum.

CHEIROSTEMON.

A tall-growing tree (*ord.* Sterculiaceæ), popularly known as the Hand Plant. It requires stove treatment. Soil, loam and peat, or leaf mould with coarse sand. Propagate by cuttings in sandy soil under a bell-glass over bottom heat.

Only Cultivated Species :—

platanoides, 30', Je., pur. red.

CHEIROSTYLIS.

A genus of very low-growing plants (*ord.* Orchidaceæ), closely allied to Goodyera and Anæctochilus. They require a stove temperature and a compost of peat and sphagnum. All have pretty foliage.

Principal Species :—

marmorata, 3", Sep., wh. (now referred to Dossinia marmorata).
 parvifolia, 3", Sep., wh. Lvs. veined with gold on a grn. ground.

CHELIDONIUM. (CELANDINE.)

A genus of hardy herbaceous perennials (*ord.* Papaveraceæ) that thrive in any fertile soil, and may be propagated by division. Majus, the Great Celandine, emits a yellowish juice, which is classed as an irritant poison; it is a popular remedy for corns and warts, but should not be applied to the skin for other purposes than these, except under medical advice.

Principal Species :—

grandiflorum (*see* majus).
 majus, 2', My., yel. There is a double form of this (flore pleno) which flowers in the late sum.; also a var. (laciniatum) with much cut leaves.

CHELONE.

The Chelones (*ord.* Scrophularinæ) are mostly hardy herbaceous perennials, and grow in any good garden soil. They may be propagated by division, or by seeds. The large majority of the species that were at first placed with Chelone have been transferred to Pentstemon, which *see*.

Principal Species :—

barbatum (*see* Pentstemon barbatum). (*syn.* Glaucium glabrum).
 cheilanthesifolia (*see* Pentstemon centranthifolia).
 glabra, 4', Aug., wh. Lyoni, 4', Aug., pur.
 nemorosa, 1', Aug., pur.
 obliqua, 4', Aug., pur.

CHENOLEA.

Greenhouse evergreen shrubs (*ord.* Chenopodiaceæ) from the Cape. They grow best in fibrous

loam and sand, and may be increased from cuttings in sandy soil beneath a bell-glass.

Principal Species :—

diffusa, 1', Aug., grn.

CHENOPODIUM.

The Goosefoots' (*ord.* Chenopodiaceæ) constitute a fairly large genus of hardy annual or perennial herbs. The various species are not remarkable for their beauty, but a number are of some economic value. Ambrosioides is the Mexican Tea Plant, and its variety, anthelminticum, yields an oil regarded in America as a valuable vermifuge. In Peru and Chili, Quinoa has long been cultivated for its seeds, which constitute a nutritious article of food, but, however cooked, do not please European palates. Then in our own country, especially in Lincolnshire and Cambridgeshire, Bonus-Henricus is quite commonly grown in vegetable gardens as a substitute for Spinach under the popular title of Good King Henry. All the species are readily raised from seed, and grow freely in good garden soil. Extra cultivation and attention to liquid feeding are essential to produce the best crops of Good King Henry.

Principal Species :—

ambrosioides, 3', Jy., grn.
 atriplicis (*see* purpurascens).
 Bonus-Henricus, 3', Je., grn.
 purpurascens, 5", Aug., ann., pur. (*syn.* Atriplicis).

Other Species :—

Botrys, 3', Je., Jy., grn.
 fatidum, 3', Je., Aug., grn.
 graveolens, 3', Oct., grn.
 opulifolium, 4', Aug., grn.
 Quinoa, 6', Je., Jy., grn.

CHERMES.

A destructive genus of aphides, of which one species, Abietis, causes the galls on the Spruce Fir. The name is also given sometimes to Psylla Mali, the Apple Sucker. C. Laricis preys upon the Larch, and often causes a great deal of damage. Remedial measures, as far as old trees are concerned, are difficult, and spraying with the various washes recommended for aphides is out of the question, owing to the expense and the trouble it would entail. In the case of young trees, burning badly infested trees or branches, and hand-picking the galls where they are not numerous, may be practised. Syringing with Quassia extract and diluted gas liquor is also helpful.

CHERRY.

The cultivated Cherry comprises an important section of the genus Prunus, from two species of which most of the varieties have been obtained, by means of numerous crosses. The sweet varieties are highly prized for dessert, and the juicy, acid fruits of the Morello section are put to various culinary and confectionery purposes.

Propagation.—From seeds and layers to obtain stocks, but the varieties are propagated by budding and grafting. Budding is preferred, as a better union is obtained, and the trees are not so liable to exude gum at the point of junction. (For modes of procedure, *see* BUDDING and GRAFTING.)

Stocks.—The stock commonly used for permanent orchard trees is the Gean, or Wild Cherry, which is obtained from seeds. The Mahaleb stock is a dwarfing stock, and is suitable for forming garden trees, chiefly of the Morello and Duke class of Cherries. The Bigarreus are better on the Gean stock.

Forms of Trees.—Trees are trained in the shape of standards for orchard culture, bushes and pyramids for gardens, standard and dwarf fan trained trees for walls, single cordons for the same purpose, and orchard house trees for pot culture.

Soil.—The Cherry prefers a deep, mellow loam, containing some lime. Proof of this is given by the way the trees flourish in some of the chalky mediums in Kent. Free drainage is of great im-



CHERRY EARLY RIVERS (see p. 201).

portance, the presence of stagnant moisture being fatal to healthy growth.

Orchard Trees.—Autumn is the best time for planting, and the trees should be placed about 30' apart. The grass under Cherries should never be mown for hay, but be grazed off by sheep. Unrestricted standards require little pruning. All that is necessary is to keep the head of the tree open, and thin out the shoots that rub and cross each other. Full bearing specimens appreciate manure in either a liquid or a solid state; and if the soil lacks lime, top-dressings of chalk or lime rubble are beneficial.

Garden Trees.—The habit of bush and pyramid trees worked on the Mahaleb stock renders them suitable for garden culture, and they should be planted in good porous soil, not less than 12' apart. Judgment must be used in the pruning of trees grown on a restricted principle, remembering that sweet Cherries produce clusters of fruit buds on spurs. Having regard to the tendency of the trees to exude gum when the sap is not flowing freely, the principal pruning should consist of pinching back superfluous lateral shoots in the summer, shortening spurs where necessary, and thinning out any crowded growths in the early autumn. Do not prune in severe weather. When young trees make exuberant growth, but produce no fruit buds, they should be lifted, have the gross roots shortened a little, and then be replanted.

Wall Trees.—On warm aspects the earliest and finest sweet Cherries are obtained from trees on walls. Deep, porous soil is requisite, and if at all retentive a dressing of old mortar rubble should be applied, and dug in before planting. The fan system of training is the best, and pruning consists

in laying in the leading shoots, and others where room admits, pinching back superfluous growths to within one or two buds, to form spurs. For the reasons stated above, summer pruning is advised. Morello Cherries are suitable for north walls, and not being of the same habit as the sweet varieties, the treatment is somewhat different. Fruit is produced chiefly on wood of the previous season's growth, and the pruning consists of cutting out old, useless branches, and laying in young shoots for fruiting. Mulching and liquid manure are beneficial to fruiting trees, and specimens showing signs of weakness are improved by removing the surface soil, and top-dressing with a loamy compost containing mortar rubble and wood ashes.

Cherries under Glass.—Cherries may be successfully grown under glass, either in pots or planted out, but they resent hard forcing. Air should be admitted on all favourable occasions, particularly during the flowering period, and watering must be carefully attended to. Give air freely after the fruit is gathered, in order to ripen the wood.

Enemies.—*Birds.*—Ripe Cherries never fail to attract birds, and the netting of wall and garden trees is the best means of preserving the crop. In orchards constant attendance is necessary when the fruit is ripe, and a gun, or other means of scaring away the birds, must be employed.

Black Aphis (A. Cerasi).—The young shoots are often attacked by this pest, which causes the leaves to curl and frequently fall. (1) Boil 1 lb. of Quassia chips and 1 lb. of soft soap in 4 gallons of water. Strain, and apply warm. (2) Boil 1 lb. of soft soap in 1 quart of water for an hour. Remove from the fire and add $\frac{1}{2}$ pint of paraffin. Add 8 gallons of clear water, mix thoroughly, and apply with a syringe.

Red Spider.—Trees on walls are liable to attack in hot, dry seasons. (See RED SPIDER.)

Slugworms (Tenthredo Cerasi).—The larvæ of this pest frequently injure Cherries by eating and



CHERRY EMPEROR FRANCIS (see p. 201).

skeletonising the leaves. Nothing is better than hand-picking and dusting the affected parts with lime.

Gumming.—The exudation of gummy matter is a common failing with Cherries. It is more prevalent in the case of trees worked on stocks than those grown on their own roots. The exudations

frequently follow a wound or bruise in the bark, and break out spontaneously when the soil is deficient or badly drained. Work the Cherries on vigorous rootstocks. Avoid young trees that are exuding sap at the point of junction between stock and scion. Remove the worst affected branches and burn them. Do not plant Cherries in badly drained soil. (See also GUMMING.)

Leaf Disease.—The latest development amongst Cherry diseases in this country is caused by a fungus which injures the leaves and fruit simultaneously. The presence of the fungus is detected by the leaves withering, but refusing to leave the trees in the autumn. The leaves are attacked at an early stage of their growth, and, being unable to perform their proper functions, the growth and general health of the trees are affected. The only known remedy at present is that of picking off and burning affected leaves.

A Selection of Varieties :—

The varieties of Cherries are numerous, and are composed of what are known as the Duke class, the Heart or Bigarreau section, and the Morellos. The following is a good selection in order of ripening. (The letter D after the name indicates Duke class, B Bigarreau, and M Morello.)

Early :—

Early Rivers, B., large blk. (see p. 200).	Governor Wood, B., large pale red.
Elton, B., pale yel., red, large.	May Duke, D., large dark red.

Medium :—

Archduke, D., dark red.	Black Eagle, B., blk.
Bigarreau, Kent (Amber Heart), B., yel., red.	Waterloo, B., large blk.

Late :—

Bigarreau Napoleon, B., yel., red, large.	Emperor Francis, dark red Bigarreau (see p. 200).
Black Tartarian, B., large blk.	Géant d'Heidelberg, B., blk. (see figure).

For Cooking :—

Kentish, M., dark red, acid.	Morello, M., blackish red, the best for cooking and preserving.
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For Orchards :—

Bigarreau, Kent (Amber Heart).	Early Rivers.
— Napoleon.	Elton.
	Kentish.
	May Duke.

CHERVIL.

A garden herb, used chiefly for flavouring soups and salads. There are several kinds, including the curled leaved Chervil (*Anthriscus cerefoliata*), Sweet Cicely (*Chærophyllum aromaticum*), and the Parsnip-rooted Chervil (*Chærophyllum bulbosum*). The latter has yellowish white roots after the character of Carrots, with foliage of Chervil flavour.

Propagation.—From seeds sown at intervals in the spring, summer, and autumn to keep up a constant supply. A north border is the best for growing Chervil in the summer, and a south aspect for the winter succession. Sow in drills 10" apart and $\frac{1}{2}$ " deep, and thin out the seedlings to 4" apart when large enough to handle; or broadcast. Chervil may also be sown in boxes under glass in the winter, if an unbroken supply of the herb be required.

Cherry Laurel (see *Cerasus*).

Cherry Pie (see *Heliotrope*).

Cherry Plum (see *Prunus cerasifera*).

Soil.—Chervil succeeds in any ordinary garden soil, but the green tops are more tender and highly flavoured when growth is quick. On this account select light, well-drained, and fairly rich soil in a light, cool position.

CHESTNUT.

The Chestnuts are very handsome and valuable trees, and add much interest and beauty to the park-land scenery of Great Britain. There are numerous species of *Æsculus* (Horse Chestnut) and *Castanea* (Sweet or Spanish Chestnut). (See the genera named.)

CHICKWEED.

A common garden weed (*Stellaria media*, *ord.* Caryophyllaceæ) that seeds freely and increases rapidly on cultivated land if left unchecked. Frequent hoeing, to cut off the plants before they flower, is the best means of eradication. Chickweed is worst on badly cultivated, waterlogged soil.



CHERRY GÉANT D'HEDELINGEN.

CHICORY.

The Succory, or wild Endive (*Cichorium Intybus*), is a useful, hardy garden vegetable, the blanched growths of which are excellent for salads, and are sometimes cooked and eaten in the same way as Seakale. It is in use during the autumn, winter, and early spring.

Propagation.—From seeds sown outdoors from April to June. Though the plant is a perennial, sowings should be made annually, as the roots are of little use after having been cut from. Sow in drills 12" apart, and thin the seedlings when large enough to 9" apart in the rows. No further attention is required during the growing period, beyond occasionally hoeing between the rows.

Soil.—Chicory will thrive in almost any kind of soil in an open situation, but it grows the best on

Chervil (see *Heliotrope*).

Chickling Vetch (see *Lathyrus sativus*).

deeply dug ground, that has been well manured the previous season.

Blanching.—The growths may be blanched out of doors in the summer, and for this purpose an early sowing should be made. Remove the outer leaves, and cover the crowns with litter or other material. By this treatment the fresh growths are blanched as they are made. The demand for Chicory, however, generally begins in the autumn, and then the roots should be carefully lifted in small quantities as required, placed in pots or boxes filled with old potting soil, leaving the crowns exposed, and brought slowly forward in a Mushroom house, cellar, or other place from which light is excluded. Chicory does not appreciate hard forcing, and a temperature of from 55° to 60° is quite high enough. The roots are better left in the ground, and taken up for blanching as required.



CHIMONANTHUS FRAGRANS.

A simple way of blanching Chicory in small quantities is to plant the roots, with crowns protruding, in a large pot filled with soil, with another flower pot inverted on the top, and covering with a mat to exclude light. Place the receptacle in a house or building having a moderate temperature.

Varieties :—

Common Chicory (Barbe de Capucin).

Witloef or Witloof (Brussels Chicory), a large-leaved var., excellent for salad.

CHILIANTHUS.

South African evergreens (*ord.* Loganiaceæ), which grow well in fibrous loam, peat, and sand in the greenhouse. Propagate by cuttings in sandy peat beneath a bell-glass.

Principal Species :—

oleaceus, 6', Aug., wh. (*syn.* Buddleia saligna).

CHILOPSIS.

Evergreen shrubs (*ord.* Bignoniaceæ), that should be placed in the intermediate house. They grow well in fibrous loam and peat; and may be propagated from half-ripe cuttings in very sandy soil beneath a bell-glass.

Principal Species :—

saligna, 10', My., ro.

CHIMAPHILA.

A small genus of hardy herbaceous perennials (*ord.* Ericaceæ), that require a rooting medium of peat and sand. They may be increased by division.

Principal Species :—

maculata, 6'', Je., pk., wh. (*syn.* Pyrola maculata). umbellata, 6'', Je., wh., pk. (*syn.* C. corymbosa and Pyrola umbellata).

CHIMONANTHUS.

The only species of this genus (*ord.* Calycanthaceæ) is fragrans (*syn.* Calycanthus præcox), which has yellow and red, deliciously scented flowers (*see figure*) in December, and grows about 9' high. The variety grandiflorus has larger flowers and is superior. Give rich sandy peat soil against a wall, and prune to encourage young wood. Propagate by layering in autumn or by seeds sown in gentle heat in March. This shrub should be grown by all who are fond of winter flowers. One bloom placed in a saucer of water will perfume a room.

Species :—

fragrans, 9', Dec., yel., red.

CHIOCOCCA.

This genus (*ord.* Rubiaceæ) has the popular name of the Snowberry. One or two of the species are violent emetics and purgatives, and, probably for these reasons, have gained some repute as cures for snake bites. They are stove evergreen shrubs, of which cuttings inserted in sand under a bell-glass over bottom heat root readily. They grow best in loam and peat.

Principal Species :—

racemosa, 6', Feb., wh.

CHIONANTHUS. (FRINGE TREE.)

Pretty shrubs or trees (*ord.* Oleaceæ), with drooping sprays of white flowers, handsome ornaments of the shrubbery or grounds. Moist, sandy peat soil. Propagated by seeds sown in spring, or by grafting on the common Ash.

Principal Species :—

retusus, 6', My., wh. virginica, 10' to 30', My., wh., very beautiful.

CHIONODOXA. (GLORY OF THE SNOW.)

Charming spring-flowering bulbs (*ord.* Liliaceæ), of great value for planting in beds, borders, or grass. There are white and also pink varieties of those named, except nana. Propagated by seeds sown in the open or in pots under glass; they come readily from seeds. Also by offsets. Any common garden soil, not too dry.

Chili Pepper (see Capsicum).

Chilian Beet (see Beta).

Chilodia (see Prostanthera)

Chimney Bellflower (see Campanula pyramidalis).

Chinese Rose (see Hibiscus).

Principal Species :

cretica, 6" to 9", Mch.,
bl., wh.
Lucilia, 6" to 9", Mch.,
bl., wh. Very beauti-

ful (*syn.* *Forbesii*) (*see*
figure).
nana, 3", Ap., wh.,
striped lil. The smallest
and rarest.

The following are considered to be only varieties of *Lucilia*, but are quite distinct for garden purposes.

Allenii, closely resembles
grandiflora, but has
more flowers on a stem.
grandiflora, 6", Mch., vio.,
very handsome and
large (*syn.* *gigantea*).
sardensis, 6" to 9", Mch.,

bl., smaller than *Luci-*
lia, and with less wh.
in centre.

Tmolusii, 6" to 9", Ap.,
pur. bl., wh., deeper in
colour and later than
Lucilia.

CHIONOGRAPHIS.

This charming herbaceous perennial (*ord.* Liliaceæ) does well in loam and peat, and may be increased by division and by seeds. It is well to provide shelter in winter.

Only Species :—

japonica, 1', My., Je., wh.

CHIONOPHILA.

The only species is *Jamesii*, a dwarf, hardy perennial (*ord.* Scrophularinæ), with dull, creamy flowers in a short, thick spike about 4" high. A dry position and protection from rain in winter are required. Increased by division or by seeds sown in spring, in a frame.

CHIRITA.

With one exception the members of this genus (*ord.* Gesneraceæ) are stove evergreens. They are well worthy of attention. Propagation may be effected by cuttings in sand under a bell-glass in spring, or by seeds; in both cases bottom heat is advantageous. A rich loam with fibrous peat forms a good compost.

Principal Species :—

depressa, 8", Jy., vio. *Moonii*, 2½", Je., bl., pur.

Other Species :—

Horsfieldii, 1½", Sep., *sinensis*, 4", Je., grh., lil.
pur., wh. *Walkerii*, 1½", Je., yel.
lilacina, 1½", Jy., pale bl. *zeylanica*, 1½", Jy., pur.
yel.

CHIRONIA.

The several plants (*ord.* Gentianæ) that make up this genus come from the Cape, and are known as the Cape Gentians. They are greenhouse evergreens, and may be increased by cuttings in very sandy soil under a bell-glass. They thrive in a compost of light loam and peat.

Principal Species :—

linoides, 2', Aug., red *peduncularis*, 2½', Aug.,
(*syn.* *ixifera*). Sep., rosy pur.
palustris, 1½', aut., ro. red.

Other Species :—

baccifera, 2', Je., yel. *jasminoides*, 2', My., pur.
floribunda, 1', My., ro. *lychnoides*, 2', My., pur.
frutescens, 1½', Jy., red. *nudicaulis*, 1', Jy., pur.
— *albiflora*, 1½', Jy., wh. *serpyllifolia*, 1½', Aug.,
glutinosa, 2½', Je., red yel.
lil. *tetragona*, 1', Jy., yel.

CHIVES.

A useful hardy garden vegetable (*Allium Schoenoprasum*, *ord.* Liliaceæ), the leaves of which are used for flavouring, and as a substitute for young Onions in salading. They are propagated from

seeds in the spring, or may be increased by dividing the clumps at the same season, and re-planting 1' apart in rows the same distance asunder. Any ordinary garden soil suits them. The leaves are fit for use as long as they remain green, and when required should be cut close to the ground, when they will be quickly succeeded by others. The bulbs may be taken up in the autumn, when the leaves die away, and dried and stored for use in the winter, as a substitute for Onions.

CHLIDANTHUS.

Pretty little bulbous plants (*ord.* Amaryllidæ), which may be grown in a warm border next to a greenhouse or wall in summer, potted in autumn,



CHIONODOXA LUCILIE.

and kept in the greenhouse in winter. Propagated by offsets. Loam, leaf mould, and peat, with a little sand, suit.

Only Species :—

fragrans, 10", Je., yel., sweet.

CHLOANTHES.

This small genus (*ord.* Verbenaceæ) comprises Australian evergreen shrubs that require a greenhouse temperature. A mixture of loam and peat suits well, and cuttings of young wood root freely under a bell-glass.

Principal Species :—

glandulosa, 2', Jy., yel., *Stoechadis*, 2', Jy., grn.,
grn. yel.
rosmarinifolia, 2', Jy.,
yel., grn.

soil and sand. Propagation is by cuttings under a bell-glass in heat, or by layers.

Only Species :—

ternata, 6', Jy., wh. (*syn.* grandiflora).

CHOMELIA.

A small West Indian genus (*ord.* Rubiaceæ) which requires a stove temperature. It may be propagated from cuttings of ripe wood inserted in very sandy soil, beneath a bell-glass over bottom heat. A compost of loam and peat is suitable.

Principal Species :—

fasciculata, 5', Je., wh. spinosa, 10', Je., wh.

CHONDRORHYNCHA.

Stove epiphytes (*ord.* Orchidaceæ), exceedingly interesting because of the charming manner in which sepals, petals, and lip are frimbriated or fringed. They are small-growing South American plants, cultivated in a few collections, but not often seen in flower. Stove treatment is essential for their well-being, and at no season of the year should drought at the roots be allowed. Use small pots and a mixture of sphagnum and peat.

Principal Species :—

Chestertoni, 6", Sep., yel., spotted red.

CHONEMORPHA.

This genus (*ord.* Apocynaceæ) comprises several species, evergreen shrubs, that thrive in the stove. Cuttings of firm wood root readily beneath a bell-glass in bottom heat, and the plants thrive in equal parts of peat and loam.

Principal Species :—

pubescens, 6', My., wh. (now *Holarrhena antidysenterica*).

CHORISPORA.

Hardy annuals or biennials (*ord.* Cruciferae) of little worth for the garden. They grow in common soil, and seeds may be sown in the open in spring.

Principal Species :—

Greigii, 1½', Je., bien. tenella, 6", Jy., hdy. ann., pur.

CHORIZEMA.

Description.—Exceedingly beautiful greenhouse sub-shrubs (*ord.* Leguminosæ) of evergreen habit, and of much value for training on low trellises or pillars or on globe- or fan-shaped wire frames. The flowers are of fine colours, and well-grown plants are among the choicest ornaments of the greenhouse or conservatory.

Propagation.—Principally by seeds, sown in fine sandy peat and loam in a hotbed or warm house in March, or by cuttings of the side shoots, removed in spring or early summer, and struck in sand beneath a bell-glass in heat.

Soil.—Peat and fibrous loam, not too rough, with about a fifth part of sharp silver sand and charcoal.

Other Cultural Points.—Firm potting is necessary for these fine plants, together with ample drainage. They require plenty of water during the growing period, but the soil must never become soured with stagnant moisture. When new growth begins, repot, prune back if dwarf plants are wanted, and afterwards give a little more than ordinary greenhouse temperature until they come into bloom, when they may be placed in cooler quarters. After flowering they may be

Choretis (*see Hymenocallis*).

placed out of doors until autumn, removing them to a greenhouse before the autumn rains come on.

Principal Species :—

angustifolium, 1½', Ap., or red (*syns.* capillipes and denticulatum).
cordatum, 1', Ap., red, yel. (*syns.* flavum, Lowii, and superbum), var. splendens (*see figure*).
diversifolium, 2', My., or red (*syns.* rhombeum [Lodd., not R. Br.] and spectabile).
Lowii (*see cordatum*).
varium, 4', Je., My., yel., red, var. Chandleri, fine.

Other Species :—

Dicksoni, 3', Je., sc., yel. (*syn.* costatum).
Henchmani, 2', My., sc. (*syn.* rhynchotropis).
lucifolium, 3', My., yel. (*syns.* nanum and triangulare).
nervosum, 2', Je., or. yel. (*syn.* parvifolium).
rhombeum, 2', Ap., My., yel.



CHORIZEMA CORDATUM SPLENDENS.

CHRISTMAS ROSE. (HELLEBORUS NIGER.) (*See also HELLEBORUS.*)

Description.—Valuable and beautiful hardy flowers (*ord.* Ranunculaceæ), prized in the garden in winter or in pots for house and greenhouse decoration. The beautiful white flowers are always appreciated. The varieties of the Christmas Rose are forms of *Helleborus niger*, and bloom earlier than the Lenten Roses—varieties of *H. orientalis*, etc. There is a considerable trade in roots specially prepared for forcing in the autumn.

Propagation.—By division, after flowering; or by seeds, which usually take long to germinate, sown in a shady border or frame as soon as ripe, or in spring.

Soil and Other Cultural Points.—Rich, heavy loam is the best. Christmas Roses ought to be

planted in early spring, the next best time being August. They like a shady position and firm planting. For pot-work the plants should be plunged in the pot in ashes, standing them on slates or boards to keep out worms. They must be in a shaded place and well supplied with water all the summer, removing them indoors when frost sets in. Plants grown in a frame or pit which could be slightly heated come in very useful in winter. Outdoor plants should be covered with



Photo: Cassell & Company, Ltd.

CHRYSANTHEMUM INDICUM, THE PARENT OF THE FLORISTS' VARIETIES (see p. 207).

frames or hand-lights to protect them from the weather, although they are quite hardy.

Principal Species and Varieties :—

- niger, 1', Dec., Jan., wh.
- angustifolius.
- caucasicus.
- lacteus.
- M^{me}. de Fourcade; very fine.
- major.
- maximus (*syn.* altifolius); very fine.
- minor.
- præcox.
- Riverstoni.
- ruber,

These and others give considerable variety of stature, size of flower, and tints.

CHRYSLID.

The chrysalid or chrysalis stage of insect life is the torpid one, during which the particular species assumes pupa form. This stage is the one immediately preceding the final and perfect condition of the winged insect. It is by carefully studying the habits of insects injurious to garden crops, and discovering where they hide during the chrysalis stage, that horticulturists are able to take advantage of any pest, kill it at a time when flight is out of the question, and thus prevent that multiplication which the perfect insects would ensure the following season.

CHRYSLIDOCARPUS.

In gardens this genus (*ord.* Palmæ) is represented by one species, an elegant stove Palm with light green fronds, better known as *Areca lutescens*. Propagation, by seeds. It succeeds in loam and peat or leaf soil, and does not require large pots.

Only Species :—

lutescens, 30' (*syn.* *Areca lutescens*).
madagascariensis is referred to *Dypsis madagascariensis*.

**CHRYSANTHEMUM.
(GENERAL.)**

A large and important genus (*ord.* Compositæ) of annual and herbaceous perennial plants. Apart from the florists' varieties of indicum, Chrysanthemums are of considerable garden interest, the perennial and annual species and their varieties being useful for bedding purposes and pot culture.

Propagation.—Annuals are raised from seeds sown in the spring, either under glass for transplanting, or outdoors where they are to flower. Hardy annuals may also be sown in the autumn. Perennials are propagated from seeds in the spring, from cuttings formed of young shoots, and also by root divisions in the case of hardy herbaceous forms.

Soil.—Good garden soil for outdoor culture, into which a dressing of well-decayed manure has been worked. For pot culture, use a compost formed of three parts turfy loam, one part leaf mould, one part decayed manure, and a free sprinkling of sand.

Other Cultural Points.—The annuals should be given an open situation and plenty of room. These plants are valuable for bedding purposes, and for providing cut flowers. They are very accommodating. Of the perennials, *frutescens* (*Marguerite*) and its varieties may be put to several uses. For summer bedding their star-like flowers are very effective, and healthy plants put out in May continue blooming till late in the autumn. They are excellent for furnishing window boxes, and few plants are more useful for greenhouse and conservatory adornment. Well-flowered plants in 6" and 7" pots are useful, and in suitable positions large specimens are highly attractive. (*See also MARGUERITES.*) Aphides are troublesome under glass, and should be checked by fumigation. A worse pest is the leaf-mining grub, which works under the leaf tissues and spoils the appearance of the plants. A close watch should be kept for this, and the grubs pinched between thumb and finger when a trace of them is seen. If allowed to spread the plants may become so badly affected as to be unsightly.

Christ's Thorn (see Paliurus).



CHRYSANTHEMUMS.

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Principal Species and Varieties:—*Annual:—*

- carinatum*, 2', Aug., wh., pur. (*syn. tricolor*).
atrococcineum, 2', sc.
burridgeanum, 2', wh., crim., yel.
flore pleno, 2', double, various colours.
Lord Beaconsfield, 2', crim., edged gold.
Morning Star, 1½', primrose.
Purple Crown, 8'', pur., sc., yel., dwarf.
W. E. Gladstone, 2', crim.
coronarium (Crown Daisy), 3', sum.; there are wh., lemon, and yel. vars.
inodorum plenissimum, 1½', double wh. (now *Matricaria inodora*).
segetum (Corn Marigold), 1½', sum., yel.
grandiflorum, 2½', sum., large yel.

the popular varieties of to-day, is a wonderful illustration, not only of horticultural skill, but of the adaptability of plants to change and improvement. Varieties of many forms and colours have been introduced from time to time. Some last longer than others, but all are displaced in turn by the additions that are made year by year. Easily cultivated, possessing great possibilities, and readily adapting itself to circumstances, it is not surprising that this is one of the most popular flowers of the day.

Propagation.—From seeds in the case of new varieties, but chiefly from cuttings. These spring up from the base of the plants, and should be of a stout, vigorous character and about 3" long. The



Photo: D. S. Fish, Edinburgh.

CHRYSANTHEMUM MAXIMUM, THE GREAT PYRENEAN DAISY.

Perennial:—

- arcticum*, 9'', sum., wh.
Catananche, 6'', spr., yel., blood red, suitable for rockery.
frutescens (Marguerite, Paris Daisy), 1½', wh., yel. centre.
Étoile d'Or, bright yel., very free.
Branching Étoile d'Or, a free habited var.
indicum, parent of florists' varieties (*see p. 206*).
Leucanthemum (Ox-eye Daisy), 2', sum., hdy., wh.
maximum, 3', large, hdy., wh. (*see figure*).
Perfection, 2½', hdy., wh., yel. centre.
Princess Henry, 1½', hdy., wh.
nipponicum, 2', wh., shrubby stems.
Parthenium, the well-known Feverfew or Golden Feather.
Tchihatchewi, 2', Je., wh., yel. (*syn. Pyrethrum Tchihatchewi*).
uliginosum, 4' to 6', Aug., wh. (*syn. Pyrethrum uliginosum*).

CHRYSANTHEMUM (FLORISTS').

The development of the florists' Chrysanthemum from the original species, *sinense* and *indicum*, to

time for propagating ranges from the early part of December to July, according to requirements and facilities. When large blooms are desired December and January are the best months, but plants for providing cut flowers and for outdoor culture may be propagated later. For early cuttings a house with a temperature of from 45° to 50° is suitable, and they root best under hand-lights, or in frames fixed near the glass. Late cuttings root readily in a cold frame. The cuttings are best inserted singly in small pots, pressing the soil firmly round each one, and giving one watering through a fine rose. Stand the pots on a bed of ashes in the frame, and keep the latter closed till roots are formed, except for a short time in the morning, when the lights should be taken off to allow moisture to be dissipated, otherwise there is a danger of the cuttings damping. Another method is to insert five or six cuttings round the edge of a 5" pot; they root freely, but there is a danger of injuring the roots when potting.

Soil.—For cuttings use equal parts of turfy loam and leaf mould, with about one-sixth of sharp sand. A good compost for young plants is formed of three parts loam, one part leaf mould, and one part decayed manure, with a sprinkling of bone meal and wood ashes, and enough sand to keep the whole open. For the final potting the soil should be coarser in character, and consist of four parts of fibrous loam pulled into pieces about the size of a Walnut, one part of leaf mould, half a part of decayed manure, with a dusting each of bone meal,

the balls, and leave 2" of space below the rim for watering.

Summer Treatment.—Select an open space for the plants, and spread out a layer of ashes on which to stand the pots. Support the growths with stakes, and in order to avoid damage by strong winds, fix a stout post at each end of every row, and stretch two wires between them, one about 3' and the other 5' from the ground. Tie the stakes securely to the wires. Care must be exercised in watering, particularly after potting. Over



Photo: Cassell & Company Ltd.

JAPANESE CHRYSANTHEMUM LILY MOUNTFORD (rosy pink). (See p. 210).

guano, and soot. Add a sprinkling of sand and wood ashes, and small pieces of charcoal. Mix the compost well a few days before using.

Potting.—When well rooted transfer the cuttings to 4" pots, and stand the plants near the glass in heated frames, or on a shelf in a cool greenhouse, where air can be given but cold draughts avoided. Give the next shift into 6" pots before the plants get very root-bound, and in March remove them to a cold frame, as the hardier Chrysanthemums are grown the better. In April, or early in May, the plants may be stood outdoors, keeping protective material handy in case of frost, and at the end of the latter month or early in June the final potting may be done, using pots from 8" to 10" in diameter. Drain the pots carefully, press the soil firmly round

supplies are injurious, but the plants should not suffer through drought. Syringing is beneficial in the afternoons of hot days.

Feeding and Top-dressing.—Little feeding is necessary till the flowering pots are well filled with roots. Liquid from sheep and horse manure, and clear soot water, are beneficial, and artificial manure may also be given by way of a change. Manurial waterings should be weak to begin with, and increase in strength as the flowering stage is approached. About the middle of August a top-dressing of material similar to that used for potting, but richer in manure, will encourage surface rooting and strengthen the plants. About 1" of fresh compost should be added, pressed firm, and watered through a fine rose.

The Selection of Buds.—When the aim of the grower is to obtain large blooms for exhibition and other purposes, the timing and selection of the buds is an operation requiring care and study. A bud is said to be "taken" when it is selected to form the future flower, but the time for this operation, and the character of the bud, are governed by the habits of different varieties, season, and time of propagation. Some varieties require pinching at an early stage, but others may be allowed to grow and naturally form a small bud, usually appearing in April or May, which is called the "break" bud, because from this point the plant breaks into new growth. This bud, being useless, is rubbed out, and several shoots are grown on. At the end of July or early in August buds are again formed, which are termed "first crown" buds. If the time of formation is suitable, the shoots round this bud are removed, and it is "taken" to form the flower. By pinching out the first crown bud and retaining several of the surrounding shoots other buds are formed in a few weeks called "second crowns." With most varieties this bud is the one "taken." In a few instances, however, it is necessary to pinch out the second crown bud and allow the shoots to grow. In the autumn they produce buds called "terminals," which mark the termination of the plant's growth. Generally speaking, the second crown buds produce the best flowers. The largest and best-shaped bud should always be selected, and the smaller ones surrounding it rubbed off.

Treatment of Bush Plants.—To obtain handsome specimens for decoration, and plenty of flowers for cutting, the growths must be pinched from time to time to encourage a bushy habit. Pinch out the points of the shoots in March or April, and again when the subsequent growths are 6" long. One or two other pinchings may follow, but the last stopping should be at the end of June or early in the following month. The growths should be staked out carefully to prevent them from being damaged by wind. (See Selection of Decorative Varieties.)

Treatment of Dwarf Plants.—An interesting phase of Chrysanthemum culture is the production of large blooms on dwarf plants. The best method is to strike cuttings in March and April, and by growing the plants in 6" and 7" pots, and securing crown buds, effective specimens are obtained. Another method is to cut back early struck plants to within 6" of the soil at the end of May or early in June. Take up three or four shoots that break from below, and select the first crown buds, which usually appear about the middle or end of August.

Autumn Treatment.—At the end of September, or early in October, the plants must be removed to their winter quarters. A light, airy house is the best, where a temperature of from 50° to 55° is maintained. Water with care as the season advances. A little fire heat, with free ventilation, is necessary to dispel damp. A dry atmosphere, with plenty of air, but avoiding cold draughts, is what the plants require during the flowering period.

Early-flowering Chrysanthemums.—Not the least useful and effective are the varieties grown for flowering in the open in late summer and early autumn. Cultivation is simple, and they are useful alike for bedding purposes and providing cut flowers. February and March are the months for striking cuttings, and the young plants should be

given cool treatment, and transferred to the beds and borders in May. By planting firmly, watering in dry weather, and attending to other cultural details, a bright display of bloom may be obtained outdoors from August onwards to the time when plants under glass commence flowering. (See Selection of Early-flowering Varieties.)

Diseases and Enemies.—*Mildew.*—A cold, damp atmosphere, both before and after the plants are housed, is largely responsible for the presence of mildew. Dust affected parts with flowers of sulphur, and after housing the plants maintain a dry atmosphere by means of a little fire heat and adequate ventilation. Syringe the plants with sulphide of potassium at the rate of 1 oz. dissolved in 2 gallons of water, before housing.

Rust.—This name is applied to a peculiar red-fruited fungus (*Puccinia Hieracii*) which has given considerable trouble of late years by affecting the foliage. The increase of the fungus is rapid, and eradication difficult. Many remedies have been tried, with varying degrees of success. Avoid propagating from infected plants. When the rust appears, isolate the affected specimens; pick off the diseased leaves and burn them. To check the



ANEMONE-FLOWERED CHRYSANTHEMUM LADY
TEMPLE (colour, terra-cotta). (See p. 211.)

fungus, spray the plants with sulphide of potassium at the rate recommended for mildew, on two or three occasions. Another remedy is that of spraying the plants with a paraffin emulsion. Bordeaux Mixture has been used with good effect in the form of a spray. (For instructions on mixing the latter, see BORDEAUX MIXTURE.)

Aphis.—Both black and green fly infest the young shoots of plants throughout the growing season, and should be checked as soon as they are discovered. Dust affected plants outdoors with tobacco powder. Syringe with a solution of Quassia and soft soap. When the plants are housed fumigate with an approved vaporiser.

Earwigs are troublesome pests during the growing period, and when the blooms are expanding. Frequently examining the plants and destroying the earwigs constitute the best remedy.

Leaf Maggot.—Sometimes the foliage is disfigured by a small leaf-mining maggot. It is easily traced by the white lines it makes between the leaf tissues, and by pinching the pest between the thumb and finger it is destroyed.

Anemone-flowered.—There are large- and small-flowered varieties in this division, which have long ray florets. The disc florets are tubular, and closely packed in the centre of the flower like a cushion.

Reflexed or Recurved.—Having florets pointing outwards and downwards.

Pompon.—Small flowers, freely produced, some of which are compact, with reflexing florets, and



Photo: Cassell & Company, Ltd.

CHRYSANTHEMUM WHITE THREAD. (See p. 211.)

Classification of Varieties.—The numerous varieties are grouped in different sections according to the shape and form of the flower.

Japanese.—This is the largest and most popular division. The varieties are numerous, and the flowers are large and loose, having long, and in some cases twisted, florets, mostly curving outwards. The introduction of varieties with incurving florets in this section has led to the formation of a subdivision known as *Incurved Japanese*. Another subdivision is formed of the thread petal varieties, which are of the Japanese character, but have long, wiry-looking, thread-like florets.

Incurved.—The flowers are globular in shape, and compact, with strap-like florets curving inwards towards the centre.

Hairy.—So called on account of the peculiar hairy threads that are produced on the face of the florets.

others resembling the *Anemone-flowered* varieties.

Single.—A free-flowering class, producing single blooms not unlike *Pyrethrums*.

A Selection of Japanese (Exhibition Varieties):—

Australie, rosy amaranth.	Julia Scaramanga, terracotta.
Charles Davis, yel., shaded bronze.	Lady Hanham, dark ro.
Edwin Molyneux, crim., gold reverse.	Le Grand Dragon, reddish or.
Ella Curtis, yel.	Lily Mountford, rosy pink (see p. 208).
Elthorne Beauty, ro.	Madame Carnot, wh.
Emily Towers, ro. pk.	Madeline Davis, wh., tinted vio.
Fair Maid, pk., silver reverse.	Marie Calvat, soft ro.
Florence Molyneux, wh.	Miss Edith Pilkington, yel., bronze.
G. J. Warren, canary.	Miss Nellie Pockett, creamy wh. [buff.
Henry Weeks, rosy crim., flushed car.	M. Chénon de Léché, rosy
H. J. Jones, crim.	
J. R. Upton, yel.	

M. Hoste, wh., ro.
Mr. T. Carrington, car.,
ro.
Mrs. Barkley, mauve,
silver reverse.
Mrs. Coombes, rosy
mauve.
Mrs. J. Bryant, rosy pk.
Mrs. J. Ritson, wh.
Mrs. White Popham, wh.,
lined car.

Mrs. W. Mease, primrose.
Mutual Friend, wh.,
tinted lil.
Phoebe, yel.
Rayonante, flesh pk.
R. Hooper Pearson, yel.
Sir H. Kitchener, chest-
nut bronze.
Soleil d'Octobre, canary.
Vivian d' Morel, mauve
pk.

Anemone-flowered Varieties :—

Caledonia, wh. guard, Lady Margaret, wh.
mauve centre. Lady Temple, terra-cotta
(see p. 209).
Delaware, wh., yel. centre. W. W. Astor, salmon,
Descartes, reddish crim., bluish ro. centre.
centre lighter.
John Bunyan, yel.

Pompon Anemone Varieties :—

Antonius, yel. Magenta King, lil.
Calliope, ruby red. magenta.



Photo: W. Rossiter, Bath.

SINGLE CHRYSANTHEMUM MISS ROSE. (Colour, pink.)

Incurved Varieties :—

Baron Hirsch, or.
Bonnie Dundee, or.,
shaded bronze.
C. H. Curtis, deep yel.
Chrysanthémiste Bruant,
rosy buff.
Duchess of Fife, wh.,
tinted lil.
Globe d'Or, yel., tinted
bronze.
Hanwell Glory, bronze
yel.
Lady Isabel, lavender
blush.

Decorative Varieties :—

Ettie Mitchell, yel.,
shaded bronze.
L. Canning, wh., late.
Lady Selborne, wh.
O. J. Quintus, mauve pk.

Reflexed Varieties :—

Boule de Neige, wh., late.
Cullingfordii, crim. sc.
Dr. Sharpe, magenta crim.
Emperor of China, wh.,
blush centre.

Lord Rosebery, mauve.
Ma Perfection, wh.
Miss Dorothy Foster,
silvery mauve.
Mrs. H. J. Jones, wh.
Mrs. R. C. Kingston, lil.
pk.
Mrs. N. Molyneux, wh.
Robert Petfield, silvery
mauve.
Topaze Orientale, straw.
Violet Tomlin, pur. vio.
Yvonne Desblanc, wh.,
tinted blush.

Pink Selborne, lil. pk.
Source d'Or, or. red, gold.
Sunbeam, golden yel.
White Thread (see p. 210).
William Holmes, crim.

King of Crimson, crim.
Lewisham Belle, sulphur.
Mrs. Forsyth, creamy
wh.
Pink Christine, pk.

Emily Rowbottom,
creamy wh.
Francis Boyce, ro. pk.
Grace Darling, lil.

Pompon Varieties :—

Aurore Boreale, or.
Black Douglas, dark crim.
Comte de Morny, bright pur.
Golden Mdme. Marthe,
golden yel.

Single Varieties :—

Daisy, wh., yel. centre.
Edith Pagram, pk., wh.
Elsie Neville, terra-cotta
red.
Florrie, cerise pk.
Framfield Beauty, crim.

Early-flowering Japanese Varieties :—

Comtesse Foucher de
Cariel, or. yel.
Crimson Marie Masse,
bronze.
Emily Grunerwald, bright
yel.
Harvest Home, bright
yel., red, tipped gold.
Lady Fitzwygram, wh.

Marie Stuart, lil. florets,
yel. centre.
Perle, ro. lil.

Julie Lagravère.
Mdme. Marthe, wh.
Walter Boyce, rosy pur.
William Westlake, golden
yel.

Mary Anderson, wh.,
flushed ro.
Miss Holden, yel.
Miss Rose, pk.
Mrs. Brown-Potter, wh.
Victoria, primrose.

Madame Marie Masse,
mauve.
Mrs. Hawkins, deep yel.
Mychett White, wh.
Ralph Curtis, creamy wh.
Ryecroft Glory, bronze
yel.
Ryecroft Scarlet, crim.
Jules Mary, deep crim.

CHRYSOBALANUS.

Evergreen, berry-bearing shrubs (*ord.* Rosaceæ), which may be increased from cuttings under a bell-glass in sand, or by layers. A warm greenhouse or cool stove is necessary. A mixture of loam and peat is best.

Principal Species :—

Iceaco, 12', Je., st., wh. oblongifolius, 3', My.,
Cocoa Plum. grh., wh.

CHRYSOCOMA.

Greenhouse evergreen plants (*ord.* Compositæ), which are grown in loam and peat and propagated



TWEEZERS AND BRUSH USED IN DRESSING
CHRYSANTHEMUMS FOR SHOW.

by cuttings of half-ripened shoots in sand in April under a glass or in a heated frame. They need a winter temperature of not less than 35°.

Principal Species :—

Coma-aurea, 2', Jy., yel.

Other Species :—

ciliata, 4', Aug., wh.

nivea, 3', Jy., yel.

The hdy. per. C. Lino-
syris is now Aster Lino-

syris. Cernua, patula,
and several others are
only vars. of Coma-
aurea.

Chryseis (see *Eschscholtzia*).

Chrysiphiala (see *Stenomesson* and *Urceolina*).

Chrysobactron (see *Bulbinella*).

CHRYSOGONUM.

The only plant of this genus (*ord.* Compositæ) met with in gardens is virginianum, 9', May, etc., yellow, a pretty, hardy herbaceous perennial, which blooms for several months, and grows in loam and peat, or leaf mould. It prefers moisture and shade. Division in spring.

CHRYSOPHYLLUM.

A genus (*ord.* Sapotaceæ) of stove evergreen trees that flourish in well-drained loam and peat. Propagation may be effected by cuttings in sand under a bell-glass over bottom heat. Several species bear edible fruit, while glycyphlæum has extracted from its bark the Monesia of commerce, which has some medicinal value.

Principal Species :—

Cainito, 50', My., wh. The West Indian Star Apple. There are several vars. of this, ranging in height from 20' to 50', and all producing wh. flowers.

Other Species :—

angustifolium, 20', My., glycyphlæum.
wh. monoppyrenum, 10', My.,
glabrum, 12', My., wh. br.

CHRYSOPSIS.

Hardy herbaceous perennial plants (*ord.* Compositæ) with rather small yellow flowers. The species grow in dry soil in their native habitats and are suitable for dry borders. They are propagated by division in spring or after flowering.

Principal Species :—

graminifolia, 2', Aug. trichophylla, 2', Jy.
mariana, 1½', Aug. villosa, 1½', Jy. (*syn.*
pilosa, 1½', Aug. Amellus villosus).

CHRYSOSPENIUM. (GOLDEN SAXIFRAGE.)

A large genus (*ord.* Saxifrageæ) of small hardy perennials, with yellow flowers and rather thick leaves. They are of little value, but the native alternifolium and oppositifolium may be used in damp, shady places, and in small ditches in the wild garden. They are propagated by division, and are about 4" high.

CHUSQUEA.

Ornamental Grasses (*ord.* Gramineæ), growing in any fertile soil in the stove. Propagation is readily effected by division and seeds.

Principal Species :—

abietifolia, 3', grn.

CHYSIS.

The several members of this Mexican genus (*ord.* Orchidaceæ) bear large and handsome flowers, which, by reason of their firm texture, last long in beauty. All are deciduous epiphytes, and should be grown in baskets suspended at the cooler end of the stove, except aurea, which prefers the cooler conditions of an intermediate house. Plant in a compost of peat, sphagnum, and crocks; afford abundance of water during the season of growth, but very little when the plants are resting. Propagation may be effected by division when new growth is commencing.

Chrysorrhœ (see *Verticordia*).

Chrysostemma (see *Coreopsis*).

Chrysothemis (see *Tassadia*).

Principal Species and Hybrids:—

aura, 1', yel.; generally flowers twice a year.	yel., marked pur.; hy- brid.
bractescens, 1', Ap., My., wh., yel.	langleyensis, 1', My., wh., shaded ro., grn.; hy- brid.
Chelsoni, 1', Meh., Ap.,	

Other Species:—

lavis, 1½', Je., yel., red.	Limminghii, 1', My., Je., yel., pur.
— superba, a fine form of the foregoing.	

CHYTROGLOSSA.

Small-growing Brazilian plants, closely allied to the *Comparettias* (*ord.* Orchidaceæ), and succeeding if similarly treated. Seldom seen in cultivation, but remarkably beautiful and interesting miniature Orchids.

Principal Species:—

aurata, 3', spr., grn., yel. lip.	Marileonice, 2', Ap., yel., spotted red.
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CIBOTIUM.

The handsome tree Ferns known under this title are now referred to *Dicksonia*, which *see*.

CICER.

Chick Pea plants (*ord.* Leguminosæ), useful as food producers, but of no horticultural or economic value in this country. Half-hardy. Propagation, by seeds.

Principal Species:—

arietinum, 2', Jy., bl.	songaricum, 2', Jy., Aug., bl.
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CIMICIFUGA. (BUGWORT.)

Effective hardy herbaceous border plants (*ord.* Ranunculaceæ), which grow best in rather strong soil with a little shade. They are propagated by division in spring or autumn, or by seeds sown in a frame when ripe or in spring.

Principal Species:—

americana, 3', Aug., wh.	foetida, 2½', Jy., wh. (<i>syns.</i> frigida and simplex).
(<i>syn.</i> podocarpa).	racemosa, 5', Aug., wh.
cordifolia, 3', Jy., wh.	simplex (<i>see</i> foetida).
davurica, 4', Jy., wh.	
elata, 3', Jy., wh.	

The form of *racemosa* known in gardens as *serpentaria* is very fine.

CINCHONA.

This genus (*ord.* Rubiaceæ) has immense value, as it provides the celebrated quinine of commerce. The plants are wholly indigenous to South America, but their cultivation has been undertaken successfully in other parts of the world, especially in the Government plantations in North India. They are tall (40' to 50') evergreen trees and shrubs, that require stove treatment and considerable care in cultivation. They all have white or pinkish flowers, which are fragrant. A compost of fibrous peat, loam, and coarse sand is suitable. Propagate by cuttings beneath a bell-glass over bottom heat.

Principal Species:—

Calisaya, "Yellow Bark."	officialis, "Crown Bark."
josephiana.	peruviana, "Grev Bark."
ledgeriana.	succirubra, "Red Bark."
nitida, "Huanaco Bark."	

Cicca (*see* *Phyllanthus*).

Cinchely. Sweet (*see* *Myrrhis odorata*).

Cichorium (*see* *Chicory*).

Cienkowskia (*see* *Kamperferia*).

Cincinalis (*see* *Notholaena*).

CINERARIA.

A large genus (*ord.* Compositæ), composed of greenhouse evergreen shrubs and herbaceous perennials, now referred by botanists to *Senecio*. The chief interest is centred in the florists' varieties, which have originated from *cruenta*. Several of the herbaceous species, including *maritima* and its variety *acanthifolia*, are excellent for bedding purposes. (*See* *SENECIO*).

Description of Florists' Cineraria.—Few greenhouse plants are more attractive and useful than *Cinerarias*, and the improvements made in the size and colouring of the flowers have led to great popularity. There are both single and double varieties, but the former are most in favour. At no time do *Cinerarias* require greater heat than that of a greenhouse, and the cultivation, though simple, must be thorough if the best results are to be obtained.

Propagation.—From seeds sown in May for early plants, and in June for succession. A shallow pan is suitable, and it should be thoroughly drained and filled to within 1" of the top with well-prepared soil. Press the compost down level, give a good watering through a fine rose, and, after the moisture has drained away, scatter the seeds thinly over the surface. Cover them with a slight sprinkling of fine soil, place a square of glass and a sheet of paper on the pan, and stand it in a partially shaded position in a temperature of about 55°. When the seedlings appear expose them to the light, give air freely, and shade from hot sunshine, but avoid cold draughts.

Soil.—For seed pans use one part of loam and two parts of leaf mould, with sufficient sand to keep the compost open. Mix the whole together, and pass it through a ¼" sieve. Use similar soil to the above for small seedlings, but coarser in character. For the final potting use equal parts of fibrous turf and leaf mould, with a little well-decayed manure, sand, and broken charcoal.

Other Cultural Points.—*Cinerarias* are often transferred from the seed pans to small pots, but a better method is to prick them off 2" or 3" apart in small boxes. At this stage they should be grown close to the glass in a cold frame, preferably under the shade of a north wall. As the plants fill up the intervening spaces in the box, transfer them to 4" pots, and keep the frame close for a few days, after which ventilation must be freely provided. As *Cinerarias* are quick-growing and free-rooting plants they should be removed to larger pots before they get in a root-bound condition. Plants may be flowered in 6" and 7" pots, but 8" and 9" are better for fine specimens. Give plenty of room after the final potting, and stand the plants on inverted flower pots, placed on a bed of sifted ashes in a frame. In all stages of growth watering must be carefully attended to, avoiding drought on the one hand, and a superabundance of moisture on the other. A gentle dewing over the foliage once a day with a syringe is beneficial in hot weather, and the plants must be protected from strong sunshine. Weak liquid manure, soot water, and occasional top-dressings of an approved fertiliser, may be given when the pots are full of roots. When frosts occur in the autumn remove the plants to a pit or light house, having a temperature of about 50°, and a fairly moist atmosphere. A bed of ashes on which to stand the plants is preferable to a wooden stage. Air should

be given on favourable occasions, and extreme care exercised in watering through the winter months. A failing with Cinerarias is their liability to damp off near the surface of the soil. When a plant goes in this way there is no hope for it, but the trouble may be prevented by careful cultivation, particularly in the way of watering and ventilating.

Enemies.—*Green Fly*.—This pest is the bane of Cinerarias, and must be kept in check if good plants are to be obtained. Free, healthy growth, and avoiding the company of other plants liable to



Photo: Cassell & Company, Ltd.

CINERARIA CANTABRIDGENSIS.

green fly, are the best preventives, and on the first appearance of the pest operate promptly with a fumigating insecticide.

Leaf-mining Grub.—The leaves of plants grown in the open through the summer are sometimes disfigured by a grub working under the skin of the leaf. Its presence is betrayed by a yellow streak, and the best remedy is to kill the grub by squeezing it between the thumb and finger.

Varieties:—

The strains of Cineraria are now so good that from a packet of seed, large flowers of wh. and various shades of bl. and red are obtained. Double vars. are also raised from seeds. A very attractive new race has been obtained by crossing grh. vars. with the species cruenta. These plants produce large heads of flowers on long stalks above the foliage, and the individual blooms are star-shaped and smaller than those of the grh. vars. The range of colour is wide, and the habit of the plants graceful. These forms are readily raised from seeds.

Principal Species:—

There are numerous species, but with few exceptions they are rarely met with in gardens. The following are amongst the best:—

cruenta, 2', sum., grh.	florus × Garden Cineraria).
per., pur. (now Senecio cruentus of Kew Hand-list; Doronicum cruentum of Index Kewensis).	maritima (correctly Senecio Cineraria), 2', sum., hdy. ev., yel., silvery foliage (acanthifolia is a var. of this).
Lynchii (Senecio multi-	

The charming Cineraria figured, named at Kew cantabridgensis, is a seedling from Cambridge, where Mr. R. Irwin Lynch has made many crosses.

For other species see *SENECIO*.

CINNAMODENDRON.

Tropical American trees (*ord.* Cannellaceæ) of no great value, but possessing some economic properties in the bark, which is tonic and antiscorbutic.

Principal Species:—

corticolum, 20', sum., grn.

CINNAMOMUM.

This moderately large genus (*ord.* Laurineæ) comes from Java, China, and Japan, and most of the species are valuable from an economic point of view as producers of Cinnamon. All are trees requiring stove or warm greenhouse treatment, and to be potted in a substantial compost of loam and leaf soil. Cuttings root readily in a propagating case if inserted in spring.

Principal Species:—

Camphora, 30', My., grn., wh.	Cassia, 40', Je., yel., grn. zeylanicum, 20', Je., grn.
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CINNAMON.

The Cinnamon of Commerce is the bark of Cinnamomum zeylanicum, a small tree found chiefly in the Malayan Archipelago. When cut longitudinally the bark parts readily from the branch, and rolls up into the long, hollow tubes so well known to cooks and confectioners. After peeling, the bark is first scraped and then dried ready for export. The thicker, stronger-flavoured bark of *C. Carsia* is sometimes substituted for the true Cinnamon. Not only is Cinnamon valuable for flavouring, but when ground to a fine powder it is useful for allaying diarrhoea and in other ways.

CIPURA.

A small genus of marsh-loving plants (*ord.* Iridææ) from tropical and sub-tropical America, requiring greenhouse protection in this country, and plenty of water.

Principal Species:—

paludosa, 5", sum., bl.

CIRCAEA. (ENCHANTER'S NIGHTSHADE.)

Interesting hardy herbaceous plants (*ord.* Onagrarieæ), propagated by division of the roots, and growing readily in any soil.

Principal Species:—

alpina, 6", Jy., pale red	lutetiana, 1', Jy., red.
(the var. intermedia is also grown).	

CIRRHAEA.

Small epiphytic Orchids (*ord.* Orchidaceæ) from tropical America. The small pseudo-bulbs have

Cinquefoil (see *Potentilla*).

Cionidium (see *Deparia*).

each a solitary, ribbed leaf; the flowers are interesting by reason of the long column. Plant in pots or baskets in peat and sphagnum, and place in a warm house, where the atmosphere is always moist.

Principal Species :—

saccata, 6", Aug., *yel.*, viridi-purpurea, 6", *Je.*,
grn. *yel.*, red, *pur.*

CIRRHOPETALUM.

Although the large natural order Orchidaceæ contains many genera remarkable for peculiar flowers, few are so curious as the Cirrhopetalums. The genus consists of about fifty low-growing, rhizomatous plants, mostly from the East Indies. Usually the flowers are borne in small umbels, and their chief attraction lies in the connate (joined) lateral sepals. The petals are small, but often end in a tuft of silky, hair-like processes, that are moved by every passing air current. Under cultivation the species need a stove temperature, and grow best in shallow Teak baskets or on blocks or rafts, planted in a mixture of peat and live sphagnum. Nothing in the way of "drying-off" must be practised, though during the winter much less water is needed than in summer. Cirrhopetalums like abundance of light, and if shaded less than has hitherto been the practice they would flower freely. So far the hybridist has left this genus severely alone.

Principal Species :—

Collettii, 8", Ap., dark <i>pur.</i> , <i>yel.</i>	ornatissimum, 9", Oct., straw <i>yel.</i> , lined <i>pur.</i>
Cumingii, 6", sum., aut., red, <i>pur.</i>	picturatum, 8", Mch., grn., red.
elegantulum, 6", My., maroon, grn.	robustum, 1½, <i>Je.</i> , grn., <i>yel.</i> , red, <i>pur.</i>
grandiflorum, 9", My., <i>yel.</i> , crim.	

Other Species :—

abbreviatum, 5", My., wh., <i>pur.</i>	Macraei, 8", Ap., br., <i>yel.</i>
amesianum, 6", <i>Je.</i> , <i>yel.</i> , <i>pur.</i>	pulchrum, 8", My., <i>yel.</i> , <i>pur.</i>
compactum, 4", My., <i>yel.</i>	Thouarsii, 1', <i>Je.</i> , <i>yel.</i>

CISSAMPELOS.

A genus (*ord.* Menispermaceæ) of twining plants that flourish in the intermediate house or stove. A compost of peat and loam is suitable, and cuttings of firm wood root in sand under a bell-glass with bottom heat.

Principal Species :—

capensis, 6', <i>Jy.</i> , grn.	tions from Pareira have
Pareira, 6', <i>Jy.</i> , grn.	received specific names.)
(Several slight varia-	

CISSUS.

A genus (*ord.* Ampelidæ) of climbing plants of little horticultural value, except discolor, which is an old-fashioned plant that has decidedly handsome leaves, and is worthy of a place in the stove. The plants flourish in fibrous peat and loam with sand, and may be propagated from cuttings in sand beneath a bell-glass, in either the stove or greenhouse, according to the species. The entire genus produces green or greenish flowers, and, strictly speaking, should now be referred to *Vitis*. The name so well known to gardeners is retained in this case for horticultural reasons, but it only refers to one species; for the rest, see *VITIS*.

Cirsium (see *Oniscus*).

Principal Species :—

discolor, 20'. A handsome st. cl., with velvety grn. lvs. prettily marked with silver (correctly *Vitis discolor*.)

CISTERN.

A cistern should be found in every garden, and the rain-water from greenhouses, and buildings generally, conducted into it, a small portable pump being used to pump the water into smaller tanks as these need replenishing. Feed cisterns are fitted to garden boilers, and if not of the self-filling kind their replenishing should be entrusted to a responsible person, otherwise a cracked boiler may easily result. A piece of perforated zinc fixed over the supply pipe at the bottom of the feed cistern will prevent large substances of any sort entering and blocking the pipe.

CISTUS. (ROCK ROSE.)

Description.—Very beautiful hardy or half-hardy shrubs (*ord.* Cistineæ), which cover themselves with pretty flowers in summer. The greater number require a warm position in this country, and it is wise to keep a plant or two in a frame for stock in case of the loss of the others in a severe winter. In the south of England and Ireland, however, several are quite hardy. Among the hardiest elsewhere are *ladaniferus* and *laurifolius*. There is a great discrepancy in the nomenclature of the *Cistus*, and for the convenience of growers the names in current use have been retained.

All flower about June, unless otherwise stated.

Propagation.—By seeds sown in March or April, under glass, the seedlings being pricked out into a frame or pots. Also by cuttings and layers, the former, about 4" long, under a hand-light or bell-glass in May or early autumn, the layers being made when the plants have gone out of flower.

Soil.—A dry, sandy soil, with a little peat or leaf mould, is best. Heavy soil may be lightened with sand and leaf soil.

Other Cultural Points.—The plants ought always to be sheltered from cold, cutting winds, and severe spring frosts must be guarded against as far as possible.

Principal Species and Varieties :—

albidus, 2', wh.	— florentinus (<i>syn.</i> asperi-
— incanus, <i>pur.</i>	folius of Sweet).
crispus, 2', <i>pur.</i>	purpureus, 2', <i>pur.</i>
ladaniferus, 4', wh.	salvifolius, 2', wh.
— albiflorus, wh.	Several forms, that
— maculatus, wh., spotted	known as <i>corbariensis</i>
<i>pur.</i>	being very pretty (<i>syn.</i>
laurifolius, 4', wh.	cymosus, of some).
longifolius, 4', wh.	

Other Species and Varieties :—

acutifolius, 2', wh.	monspeiliensis, 2', wh.
Clusii, 3', wh.	parviflorus, 3', red (<i>syn.</i>
cordifolius, 4', wh.	complicatus).
cyprius, 4', wh.	platysepalus, 4', red.
hirsutus, 2', wh. (<i>syn.</i>	populifolius, 3', wh.
laxus).	sericeus, 2', red.
lusitanicus, 3', <i>yel.</i> (cor-	vaginatus, 2', My., ro.
rectly <i>Helianthemum</i>	villosus, 3', <i>pur.</i>
variabile).	

CITHAREXYLUM.

A genus (*ord.* Verbenaceæ) of stove trees that grow satisfactorily in a mixture of loam and peat,

and may be propagated from cuttings under a bell-glass over bottom heat.

Principal Species :—

caudatum, 20', Je., wh. quadrangulare, 30', Je., wh. Fiddle Wood Tree.

Other Species :—

dentatum, 15', Jy., wh. subserratum, 15', Jy., wh.
molle, 15', Jy., cream. villosum, 10', Jy., wh.
pentandrum, 6', Jy., wh.

CITRIOBATUS.

The three species of this genus (*ord.* Pittosporæ) are Australian fruit-bearing evergreen shrubs, and may be accommodated in the greenhouse. A com-



EMBIGUO OR NAVEL ORANGE (*see* CITRUS).

post of fibrous peat three parts, with loam one part, and charcoal and sand, suits well. Propagation may be effected by cuttings in sand under a bell-glass.

Principal Species :—

multiflorus, 3', Aug., wh. pauciflora, 3', Aug., wh.

CITRULLUS.

Rambling stove plants (*ord.* Cucurbitacæ), liking rich loam and a hot, moist atmosphere.

Principal Species :—

Colocynthis, 6', sum., vulgaris, 6', sum., flowers
flowers yel., fruits grn., yel., fruits reaching 10'
wh. "Colocynthis," or in diameter. "Water
"Bitter Apple." Melon."

CITRUS. (ORANGE, LEMON, etc.)

This most valuable genus (*ord.* Rutacæ) provides us with the Orange, Lemon, Citron, Lime, and Shaddock of commerce. The numbers of these fruits that are imported into this country are almost beyond count. Apart from the value of the fruits,

Citron (see Citrus).

the demand for Orange flowers far exceeds the supply. Some few of the species are hardy, but the majority must be accorded a place in the greenhouse or the warm conservatory. Both Citrons and Lemons do well if trained to cover the walls of greenhouses, while the little Otaheite Orange (*C. japonica*) makes a charming pot plant.

Propagation.—(1) Seeds, which will germinate in the greenhouse; (2) layers and cuttings, the plants resulting being employed as stocks for buds (*see* BUDDING); or grafts (*see* GRAFTING) from fruiting plants. Cuttings should be formed of two year old wood, and inserted in very sandy soil under a bell-glass or in a propagating case, preferably with bottom heat. Side-grafting is usually most successful. Some of the best growers find inserting the buds just as growth commences in spring more profitable than when the plants are in very active progress.

Soil.—For the young plants leaf mould and fibrous peat. This encourages growth, but is not favourable to fruiting. In the later stages, therefore, employ fibrous loam, chopped or pulled to pieces, with pounded charcoal and crushed bones; add coarse sand if the loam be very adhesive. Pot or plant firmly over perfect drainage.

Other Cultural Points.—Plants fruit better when planted out than when grown in pots. Where the latter system is adopted liquid manure will be found advantageous. The plants must be kept scrupulously clean, especially from thrips, which are liable to do much damage. The winter temperature of the structure should not fall much below 45°.

Principal Species :—

Aurantium, 15', wh.; the Orange. There are several vars., of which the St. Michael's (including the forms Bottellia and Exquisite); the Malta (including Blood and Egg); Embiguo (Navel Orange) (*see* figure); Jaffa, the largest Orange; the Silver or Plata (*see* p. 217); and the small flat fruit Tangerine, are excellent.
—vulgaris, 18', sum., wh.; the Seville or Bitter Orange, which is used in the making of marmalade.
decumana, 15', Je., wh.; the Shaddock. The fruits sometimes weigh 12 lb., and the slightly acid juice is an excellent thirst quencher.
Medica, 10', Je., wh.; the Citron. This is preserved in large numbers and is of great economic value.
—Limetta, 10', Je., wh.; the Lime. There are large and small, bitter and sweet vars.
—Limonum, 15', sum., wh.; the Lemon. The best vars. are the Imperial and the White; Rivers' Bijou is a splendid small var.
nobilis, 18', sum., wh.; the Mandarin Orange.
trifoliata, 4', sum., wh., hdy. ev. shr.

It is worthy of note that well-cultivated home-grown Oranges and Lemons are immeasurably superior in flavour to imported fruits, as they can be ripened on the tree, whereas those imported are harvested long before the flavour has become fully developed. All the following are suitable for cultivation under glass :—

Varieties of Orange :—

Blood.	St. Michael's.	Sustain.
Jaffa.	Seville.	Tangerine.
Navel.		

Varieties of Lemon :—

Bijou.	Sweet.	White.
Imperial.		

CLADANTHUS.

A plant (*ord.* Compositæ) related to Anthemis. The only species is *proliferus*, a half-hardy annual, 2' July, yellow, but of no garden value. Common soil.

CLADRASTRIS.

Pretty, hardy, deciduous trees (*ord.* Leguminosæ), with spikes of white flowers in July or August. They like a sunny situation and a warm, dry soil. Propagated by layers or by budding or grafting; also by imported seeds.

Principal Species :—

amurensis, 6', wh. (*syn.* tinctoria, 15', Jy., wh. Maackia amurensis). (*syn.* lutea and Virgilia lutea). Yellow Wood.

CLARKIA.

Charming hardy annuals (*ord.* Onagrarieæ), with bright-coloured flowers and of slender branching habit. The leading species, *elegans* and *pulchella*, differ mainly in the former having entire petals and the latter being lobed. They are both of great beauty in the border or in flower beds. Propagated by seeds sown in the open where they are to bloom in March or April, or in autumn for spring bloom, in the reserve garden, whence they may be removed in spring, with soil attached, to where they are to flower. Protect the latter in hard frost with branches or Aster stems. Thin out the seedlings to 9" apart. Rich, well-manured garden soil.

Principal Species and Varieties :—

elegans, 2', Jy., ro. pur. *pulchella*, 2', Je., various. Many vars., good ones being Purple King, White Queen, Salmon Queen, and *flore pleno*. Many single vars. ranging from wh. to pur., also a double. *rhomboides*, 2', Je., pur. Smaller than preceding.

CLARY.

The old English Clary, or Sage (*Salvia Sclarea*), is a native plant which is still grown as a pot-herb and used in various ways. It formerly had a great medicinal reputation, and derived its name of Clary, or clear-eye, from the seeds having been found useful to "clear the eye." Raised from seeds sown in spring, and thinned to 2' apart. Light soil.

CLAUSENA.

A small genus of stove evergreen trees (*ord.* Rutaceæ), that produce white flowers, and, in the case of *corymbiflora*, edible fruits. A compost of peat and loam answers well; propagation may be effected from cuttings of ripe wood under a glass in heat.

Principal Species :—

corymbiflora, 15', Jy., wh. *Wampii*, 15', sum., wh. *pentaphylla*, 20', Jy., wh. The Wampee tree.

CLAVIJA.

These are evergreen trees (*ord.* Myrsinæ) that must be grown in the stove. Cuttings inserted in sand under a bell-glass in heat root freely. Soil, loam and peat in equal parts, with coarse sand.

Principal Species :—

fulgens, 10', Jy., or. red. *ornata*, 15', Jy., Aug., or.

Other Species :—

macrocarpa, 20', Aug., wh. *riedeliana*, 15', Jy., or. *rodekiana*, 10', Jy., or.

Clandestina (*see* *Lathræa*).

CLAY.

Clay enters to some degree into the composition of all fertile soils. When it is found in excess the soil is called a clay soil; and as it is wet, sour, and unworkable in winter, and in hot, dry summers develops yawning cracks or fissures on its surface, it is not wholly desirable. It must, however, be remembered that clay suits some crops admirably, notably Celery. It may be greatly improved and rendered fertile by burning on a good body of fire in the garden; also by ridging and trenching. Clay is useful for adding to soils that are too light and for puddling the sides and bottoms of ponds.

CLAYTONIA.

Dwarf, rather succulent, hardy annual or tuberous-rooted plants (*ord.* Portulacæ), which like a rather shady position in leaf soil and loam or peat. The annuals are propagated by seeds sown in spring; the others by offsets and division in spring.

Principal Species :—

caroliniana, 6'', My., per. *slane* in America (*syn.* *pk.* (*syn.* *spathulæ-folia*). *cubensis*). *sibirica*, 6'', Mch., hdy. *perfoliata*, 6'', Je., hdy. *ann.*, *pk.* *virginica*, 4'', Ap., per., *ann.*, wh., used as Pur. wh.



SILVER OR PLATA ORANGE (*see* p. 216).

CLEISOSTOMA.

The genus *Cleisostoma* (*ord.* Orchidaceæ) holds quite an unimportant position horticulturally. The several species are of comparatively small growth, and have small and unattractive flowers. Aerial roots are produced very freely, consequently baskets or rafts, with a little peat and sphagnum,

should be provided for them. Being East Indian these Orchids require a high temperature and moist atmosphere.

Principal Species :—

discolor, 1½', Mch., yel., wh.	roseum, 1½', Sep., rosy yel.
ionosmum, 2', Mch., yel.	tridentatum, 1½', sum., grh., red, wh.
latifolium, 1½', Mch., yel., red.	

CLEMATIS. (VIRGIN'S BOWER.)

Description.—The Clematis (*ord.* Ranunculaceæ) is among the finest of our climbing or trailing plants, and is of inestimable value in the garden



Photo: Cassell & Company, Ltd.

CLEMATIS FAIR ROSAMOND, GROWN AS A PILLAR PLANT AT KEW (see p. 219).

or grounds. Whether grown on trellises on walls, rambling over trees, trailing over large rockwork, forming beds, or for ornamenting the greenhouse or conservatory, it has few, if any, superiors. Many of the species are very beautiful, but it is mainly to the seedlings and hybrids that we must look for our finest flowers. The erect or non-climbing species are also worthy of a place in the border, where several of them will give much pleasure. Those who are best acquainted with the Clematises are aware of the wealth of variety which they can give, not only by the large-flowered hybrids so familiar, but also by others from different parents, which are gradually being improved, and which will be valuable additions to our gardens.

Propagation.—Clematises are generally propagated by grafting on the roots of the common *Vitalba*, although those of other species are quite as good. This is done as early as possible, the roots, after grafting, being placed in small pots put in a propagating case in heat. After union they may be gradually hardened off before placing outside. Layers also root in about a year. Cuttings of one or more eyes may also be rooted in a propagating case, or even in a warm greenhouse, if covered with a bell-glass. Seeds grow readily if sown in spring in light sandy soil in pots or pans in a heated or cold frame. Young plants should have the ordinary treatment of seedling hardy flowers, but it is advisable to keep them under glass for some time, so as to make them strong before planting out. Some of the species flower in the first or second year, but with the others more patience is needed.

Soil.—A rich, rather heavy soil, but not stiff and clayey, will grow the Clematis well. It ought to be deeply trenched, and manure, well rotted, plentifully added as the work proceeds.

Other Cultural Points.—The Clematis is subject in some gardens to a disease which causes it to die off. This appears to be caused by an unknown constituent in the soil in these gardens, but in some where the Clematis has previously failed it has been found that the plants will grow satisfactorily if the lower portions of the stems are shaded from the sun by other plants. This is worthy of a trial in gardens where the plant has hitherto been lost. Against walls and trees the Clematis frequently suffers from drought, and in these positions it ought to have occasional soakings with water, to which some good fertiliser has been added. An occasional dressing of lime will also be found beneficial. Attention must be paid to training the plants, and those on trellises must be carefully tied in as they grow, to prevent the shoots from being broken or twisted among each other. Pruning requires to be performed according to the class to which the plant belongs. Thus, those which flower on the old, or ripened, wood, only require thinning out or slight cutting back; while those which bloom on the summer shoots may be cut back considerably. Such Clematises as *Jackmanii* may be cut almost to the ground if wanted to cover only a small space, or to be limited in height. The *Montana*, *Patens*, and *Florida* types all flower from the old wood. The *Lanuginosa* section flowers on short, summer shoots, and generally needs little cutting back. The greenhouse species are very ornamental, and require a temperature of at least 40°. For an unheated house the varieties of the *Lanuginosa* type are well adapted. *C. indivisa lobata* is very fine in a heated house. Clematises are generally supplied in pots, and may thus be planted at almost any season, spring or early summer being the best, however, for the purpose.

Principal Species and Varieties :—

coccinea, Jy., sc.; climbing, a beautiful plant. Several hybrids of this will be found below (<i>syns.</i> <i>Pitchei</i> , <i>Carr.</i> not <i>Torr.</i> and <i>Gray</i> , and <i>Viorna</i> var. <i>coccinea</i> .)	cespitosa, canaliculata, fragrans, maritima, and paniculata).
Flammula, Jy., etc., cl., wh. (<i>syns.</i> <i>angustifolia</i> ,	florida, Ap., Sep., cl., wh. Very beautiful.
	heracleifolia, 2', Jy., bl. Good for border (<i>syn.</i> <i>Hookeri</i>).
	— <i> davidiana</i> (<i>syn.</i> <i>C.</i>

davidiana is pretty, bl.
(*syns.* *daveyana* and
tubulosa).
indivisa, Ap., cl., grh., wh.
— *lobata*, charming for grh.
lanuginosa, Je., cl., bl.
Parent of many fine
vars.

Other Species and Varieties :—

(Cl. and hdy., unless otherwise marked.)

æthusæfolia, Sep., wh.
— *latiseeta*.
alpina is the correct name
of *Atragene alpina* of
Linnaeus.

montana, My., cl., wh.
— *grandiflora*, finer.
Vitalba, Jy., etc., cl., wh.
(*Traveller's Joy*, *Old*
Man's Beard, etc.)
Viticella, Jy., etc., cl., bl.
(*Vine Bower*).

crispa, Sep., lil. (*syn.*
cordata).
daurica, Sep., yel.
dioica, st., yel. (*syn.*
americana).

recta, 3', Jy., wh. Several
vars., including flore
pleno with double
flowers (*syn. erecta*).
reticulata, Sep., pur.
— *Hendersoni* (*syn. C.*
Hendersoni) has hand-
some pur. flowers.
robertsiana, 5', yel.
Stanleyi, 6', grh., wh. to
pur.

Selection of Varieties :—

[NOTE.—There are so many of the highest
beauty, whose number is always increasing, that
only a few can be named.]

stans, 3', Sep., bl.
verticillaris (correct name
of *Atragene americana*).
Viorna, Aug., pur.
viornoides, Aug., lil.
virginiana, Jy., wh. (not
apiifolia).
Williamsii, Jy., wh. (*syn.*
Fortunei).



Photo: C. R. Bick.

CLEMATIS MONTANA ON A VERANDAH.

apiifolia, Aug., wh.
aristata, Je., grh., yel.,
grn.
aromatica, 5', Jy., bl.
(*syns.* *caerulea odorata*
davurica of gardens, and
odorata of gardens).
barbellata, My., grh., pur.
brachiata, 2', grh., yel.,
grn.
brasiliensis, st., wh.
brevicaudata, wh.
calycina, Feb., grh., in
N., pale yel. (*syn.*
balearica).
campaniflora, Je., dull wh.
(*syns.* *campanulata* and
crispa and *viornoides* of
gardens).
caripensis, st., wh.
chinensis, grh., wh.
cirrrosa, Meh., wh. (*syn.*
pedicellata).
Colensoi, grh., yel.
comata, Aug., pale yel.
(*syn. venosa*).

Douglasii, 1', Jy., pur.,
wh.
Fremontii, 1', pur.
fusca, 6', red br
grandiflora, st., yel.,
grn.
grewiaeflora, yel.
hakonensis, Aug., red
pur.
integrifolia, 3', Jy., bl.,
double and wh. vars.
also (*syns.* *latifolia* and
ovata).
ligusticifolia, wh.
— *californica*.
ochroleuca, 2', Je., yel.
odorata, Je., grh.
orientalis, Aug., yel. (*syn.*
graveolens of *Bot. Mag.*
4495).
paniculata, Jy., wh. (*syn.*
Vitalba var. *japonica*).
Pitcheri, Aug., pur. (*syn.*
coloradoensis).
— *Sargentii* (*syn. C. Sarg-*
gentii).

Patens type, flowering in My. and Je. Prune in
Feb. or Mch., only removing straggling or crowded
branches :—

Fair Rosamond, blush (<i>see p. 218</i>).	Miss Bateman, wh. (<i>see</i> <i>p. 220</i>).
Lady Londesborough, silver grey.	Miss Crawshaw, pk.
Lord Londesborough, mauve.	Mrs. Cholmondeley, lil. bl.
	Mrs. G. Jackman, wh.
	The Queen, lavender.

Florida type. Prune same as above :—

Barillet Deschamps, mauve, double.	Duchess of Edinburgh, wh., double.
Battle of Woking, silver grey, double.	John Gould Veitch, lavender blue, double.

Lauginosa type. Prune as above :—

Beauty of Worcester, vio.	Lord Neville, plum.
Blue Gem, pale bl.	Louis van Houtte, pur.
Enchantress, wh., double.	Otto Fröbel, grey wh.
Henryi, cream.	Venus Victorix, lavender, double.
lilacina floribunda, grey lil.	

Viticella type. Cut back to within a few inches of the soil in Nov. :—

- | | |
|------------------------------------|---------------------------|
| Hendersoni, pur. | — alba, wh. |
| Lady Bovill, grey bl. | — purpurea plena elegans. |
| marmorata, mauve, wh. | — rubra grandiflora. |
| Viticella grandiflora punicea, sc. | — venosa, pur. |



Photo: Cassell & Company, Ltd.

CLEMATIS MISS BATEMAN GROWN AS A POT PLANT (see p. 219).

Jackmanii type. Prune same as *Viticella* type :—

- | | |
|-----------------------------------|-------------------------------------|
| Jackmanii, vio. pur. | Prince of Wales, puce pur. |
| — superba, dark vio. pur. | Snow-white Jackmanii (Smith's), wh. |
| Madame Edouard André, bright red. | |
| Mrs. Baron Veillard, lil. ro. | |

Hybrids of coccinea :—

- | | |
|------------------------------------------|----------------------------|
| Countess of Onslow, pur., sc. | Grace Darling, car. |
| Duchess of York, blush pk. (see p. 221). | Sir Trevor Lawrence, crim. |
| Duchess of Albany, pk. | Ville de Lyon, car. |

CLEOME.

A large genus (*ord.* Capparidaceæ), comprising hardy annual, hardy herbaceous, hardy evergreen

shrubs, and greenhouse and stove shrubs and herbaceous plants. The annuals may be raised from seeds sown under glass, and transplanted as may be necessary; the stove and greenhouse shrubs from cuttings in sand in heat; and the herbaceous perennials by division. A light, rich, well-drained soil is suitable.

Principal Species :—

- | | |
|---------------------------------------|-----------------------------------------|
| gigantea, 10', Je., st. ev. shr., wh. | speciosissima, 2', Jy., hdy. ann., pur. |
| heptaphylla, 1½', Jy., st. ann., wh. | spinosa, 3', Jy., st. ann., wh., flesh. |

Other Species :—

- | | |
|-------------------------------------|--------------------------------------------|
| arabica, 2', Je., hdy. ann., yel. | Houstonii, 1', Je., st. ann., wh. |
| arborea, 8', Je., st. ev. shr., wh. | lutea, 1', Jy., hdy. herbaceous per., yel. |
| diffusa, 1', Je., st. ann., grn. | pubescens, 1½', Jy., hdy. ann. |
| | rosea, 2', Je., st. ann., red. |

CLERODENDRON.

Description.—This genus (*ord.* Verbenaceæ) comprises a large number of species that are seldom found in gardens, and a few which have a place in most collections. The majority are stove evergreens, and the remainder greenhouse evergreens.

Propagation.—Seeds of some of the species ripen under favourable conditions, and may be sown when harvested, or in the following spring, in boxes of light flaky soil in heat. Cuttings of firm growths root readily in very sandy soil beneath a bell-glass in a high or a low temperature, according to the species.

Soil.—A suitable compost consists of fibrous loam and fibrous peat each two parts, leaf soil one part, and a little decayed manure, with some charcoal and sharp sand. Pot or plant firmly, and give liquid manure when growth is very active.

Other Cultural Points.—An abundant supply of water is necessary in the growing season, but in autumn and winter only sufficient should be given to keep the wood plump. The strong, well-ripened growths produce the flowers; others and unripened parts may be removed. Never let plants in pots become root-bound, and avoid hot, dry positions. Care must be taken that red spider does not obtain a firm hold.

Principal Species :—

- | | |
|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Balfouri (see Thomsonæ). | — speciosissimum, 10', sum., st. ev. cl., br., sc. |
| fallax, 2', Aug., st. ev. shr., sc. | Thomsonæ, 6', sum., st. ev. cl., sc. The most popular species; the var. Balfouri is better known. |
| fragrans, 6', Oct., wh., red. | trichotomum, 6' to 9', Aug., grh. ev. shr., wh., calyx red; thrives out of doors in very favourable localities. |
| infortunatum, 6', Sep., st. ev. shr., vivid sc. (<i>syn.</i> viscosum). | |
| speciosum, 10', sum., st. ev. cl., sc.; a hybrid. | |
| splendens, 10', Je., st. ev. cl., sc. | |

Other Species :—

- | | |
|-----------------------------------|-------------------------------------|
| aculeatum, 4', Sep., st., wh. | Minahassæ, 6', Aug., st., yel., wh. |
| floribundum, 6', Jy., st., wh. | nutans, 6', Nov., st., wh. |
| fœtidum, 5', Aug., grh., ro. | squamatum, 10', Aug., st., sc. |
| heterophyllum, 3', Aug., st., wh. | volubile, 6', Aug., st., wh. |
| inermis, 4', Jy., st., wh. | |

CLETHRA.

This genus (*ord.* Ericaceæ) comprises greenhouse evergreen and hardy deciduous shrubs. Nearly all

are very ornamental. The greenhouse species are increased by cuttings in spring in very sandy soil under a bell-glass, and the hardy species by layering. A mixture of three parts peat and one part loam suits.

Principal Species :—

alnifolia, 4', Sep., hdy., wh.
arborea, 8', Sep., grh., wh. There is a dwarf

var. growing 2' high, and also one with variegated leaves.

New Zealand and the Parrot-beak Plants. They are evergreen shrubs and sub-shrubs that will grow against a warm wall, but are better accommodated in the greenhouse. Plants may be raised from seeds in the greenhouse, but considerable care is required. Cuttings root easily in sandy peat under a bell-glass, and a constant succession of young plants will give more satisfaction than old stock. A mixture of peat, loam, and coarse sand is best.



Photo: Cassell & Company, Ltd.

CLEMATIS DUCHESS OF YORK, ONE OF THE BEAUTIFUL COCCINEA HYBRIDS (colour, bluish pink). (See p. 220).

Other Species and Varieties :—

acuminata, 10', Sep., hdy., wh. (*syn.* *montana*).
alnifolia Michauxii.
— *paniculata*, 4', Sep., hdy., wh.
— *scabra*, 4', Sep., hdy., wh.
— *tomentosa*, 4', Sep., hdy., wh.
canescens, Aug., hdy., wh.
ferruginea, 4', Aug., grh., wh.
incana (*see* *alnifolia tomentosa*).
mexicana, 9', Aug., hdy., wh.
montana (*see* *acuminata*).
paniculata (*see* *alnifolia paniculata*).
pubescens (*see* *alnifolia tomentosa*).
quercifolia, 9', Aug., hdy., wh.
scabra (*see* *alnifolia scabra*).
secundiflora, aut., wh.
tinifolia, 20', Sep., st., wh.
tomentosa (*syn.* *alnifolia tomentosa*).

CLEYERA.

A small genus (*ord.* Ternstroemiaceæ) of greenhouse evergreen shrubs, that thrive in fibrous peat and coarse sand, and may be propagated from cuttings in similar soil under a bell-glass.

Principal Species :—

japonica, 5', Ap., cream.

CLIANTHUS.

These brilliantly beautiful plants (*ord.* Leguminosæ) are popularly known as the Glory Peas of

Perfect porosity and drainage are essential to success.

Principal Species :—

carneus, 4' to 5', My., flesh (now *Streblorhiza speciosa*).
Dampieri, 3', Ap., sc.
There are one or two excellent vars. of this species, including *germanicus* and *marginatus* (*see* p. 222).
puniceus, 4', My., cr. The var. *magnificus* is very handsome.

CLICK BEETLE. (SKIP-JACK.)

The progenitor of the deadly wireworm, whose destructive work is all too familiar alike to the gardener and the agriculturist. There are several kinds known to agricultural science, the larvæ of all being classed as wireworms, and capable of doing great damage. (For remedies, *see* WIREWORM.)

CLIDEMIA.

A number of shrubby plants constitute this tropical American genus (*ord.* Melastomaceæ). The stems are hairy, the leaves silky, and the flowers rose or white. Propagated by seeds and cuttings. Sandy loam and leaf soil for compost, and a position in a cool stove, will meet their requirements.

Principal Species :—

elegans, 3', Aug., wh.
rubra, 3', My., pur.

vittata, 3', Jy., ro., leaves
 striped.

CLIFTONIA.

This genus (*ord.* Cyrillææ) comprises one species only. It is a half-hardy evergreen shrub, readily increased from cuttings. It thrives in peat and loam in equal proportions.



Photo: Cassell & Company, Ltd.

CLIANTHUS DAMPIERI AS A BASKET PLANT (*see* p. 221).

Only Species :—

nitida, 6', My., wh. (*syns.* *ligustrina* and *Mylocaryum ligustrinum*, the Buckwheat Tree).

CLIMATE.

The effects of climate upon vegetation are so great that horticulturists, if they would be successful, must regulate the plants and crops cultivated in accordance with it. Meteorological records are particularly valuable in the districts where they are taken, but a mere table of average rainfall and temperature is quite inadequate. A knowledge of the extremes likely to occur during any month or part of a month is of vastly more importance than the tables of averages referred to. For instance, the average temperature in the Thames Valley for May is fairly high, yet those long resident in that district are well aware that several degrees of frost are likely to occur, during the night, about May 20, 21, and 22, and such knowledge has been the means of saving many a Strawberry crop. Besides rainfall and temperature, there is the prevailing wind to be taken into account, while the nature of the soil dealt with has also a great deal

to do with the effect climate has upon the plants. Climate and soil must be duly considered, and, given a good knowledge of these, it is not difficult nowadays to select the most suitable subjects for any particular garden.

CLIMBERS.

Valued as climbing plants have always been in the best gardens, their importance is becoming still more highly appreciated. One definition of a climber is a plant which attaches itself to a support by tendrils, roots, or other organs, without requiring to twist itself round, as in the case of what are technically known as "twining" plants. Useful as this distinction is, it is little observed in ordinary garden practice, and people often even include in the expression "climbers" plants which are neither climbing nor twining in their habit, but are adapted for covering walls or trellises, and have to be fastened to them. The uses of climbers are many, and they add much to the appearance of any garden, where they can have something to cling to. Whether used for covering walls, trellises, pillars, or arches, they give an element of picturesqueness. Under glass, also, they are most valuable. For covering old and unsightly trees they are now being much more largely used, and in this way a new and beautiful feature is being given to pleasure grounds, or old gardens in which trees were becoming unsightly but could not be spared. Cultural details of the several plants named will be found under their respective titles, but a few general hints may be useful, and will give growers an idea upon what lines to proceed. It is highly probable that the climbing habit has been induced in many plants by the overshadowing of taller and more vigorous-growing subjects. These shut out much of the light and air, and would have caused the death of the dwarfer plants had they not in a literal sense risen to the occasion.

Soil.—Climbers generally require a specially prepared site, so that they may receive a good start and grow rapidly. A large hole, several feet across, ought to be dug and deeply trenched, adding, as the work proceeds, a good supply of well-rotted animal manure or artificial fertilisers. This preparation is especially necessary in the case of plants in the neighbourhood of trees or shrubs. In this prepared ground the plants should be placed in autumn or spring, treading them well in and fixing them firmly to the support to which they are to cling. Climbers grown in pots may be planted at any season.

Other Cultural Points.—Climbers against walls and trees often suffer from want of water, and this ought to be liberally supplied when required in such quantity as to thoroughly soak the soil.

Pruning.—In pruning or thinning out climbers regard must, of course, be paid to the flowering of the plants and whether they bloom on old or young wood. They must not, however, be allowed to become crowded and untidy; and even for picturesque effects it is often advisable to give a considerable amount of time to thinning out and removing old wood. Plants under glass may either be planted out in a prepared border or grown in pots. In some cases it is necessary to adopt the latter course, and it is needful to remember that the plants require support if vigorous growth is expected, and that liquid manure or top-dressing with fertilisers is necessary.

Selections of Climbers :—

[For details, reference should be made to the various genera under their titles.]

Hardy Perennials :—

(With protection in some cases in cold districts.)

Actinidia.	Hablitzia.	Polygonum.
Ampelopsis.	Hedera.	Rose.
Apios.	Jasminum.	Rubus.
Aristolochia.	Lardizabala.	Smilax.
Asparagus.	Lathyrus.	Stauntonia.
Berberidopsis.	Lonicera.	Tamus.
Berchemia.	Lophospermum.	Tecoma.
Calystegia.	Lycium.	Tropaeolum.
Celastrus.	Menispermum.	Vitis.
Clematis.	Muehlenbeckia.	Wistaria.
Eccremocarpus.	Periploca.	

Tender Perennials :—

Allamanda.	Clematis.	Littonia.
Antigonon.	Clerodendron.	Lonicera.
Argyrea.	Clianthus.	Maurandya.
Aristolochia.	Clitoria.	Passiflora.
Asparagus.	Cobaea.	Physianthus.
Banisteria.	Combretum.	Piper.
Bauhinia.	Convolvulus.	Pleroma.
Beaumontia.	Eccremocarpus.	Plumbago.
Bignonia.	Ficus.	Smilax.
Billardiera.	Gloriosa.	Sollya.
Blumenbachia.	Hardenbergia.	Swainsonia.
Bomarea.	Hibbertia.	Tacsonia.
Bougainvillea.	Hoya.	Tecoma.
Cestrum (Hab-	Ipomoea.	Thunbergia.
rothamnus).	Kennedyia.	Tropaeolum.
	Lapageria.	Vitis.

Hardy Annuals :—

Amphicarpaea.	Ipomoea.	Maurandya.
Convolvulus.	Lathyrus.	Tropaeolum.

Half-hardy Annuals :—

Grammatocarpus.	Ipomoea.	Thunbergia.
Gourds, ornamental.	Mina.	Trichosanthes.

Tender Annuals :—

Citrullus.	Porana.	Trichosanthes.
Ipomoea.	Thunbergia.	

CLINTONIA.

A genus of about twenty species of herbaceous plants (*ord.* Liliaceæ), valuable for damp, shady places in peat and sand. Only a few are in cultivation. Propagated by division of the roots in spring. For *Clintonia* of Douglas, *see* DOWNINGIA.

Principal Species :—

andrewsiana, 2', Ap., ro.	bellata and borealis
borealis, 1', My., yel., grn.	var.).
umbellulata, 9'', My., wh.	uniflora, 6'', Jy., wh. (<i>syn.</i>
(<i>syn.</i> Smilacina um-	Smilacina uniflora).

CLIPPING.

Deciduous hedges of all sorts may be trimmed with advantage once or twice a year. For all small-leaved subjects, such as Box, Yew, and Privet, a pair of specially made shears is the best tool to use, as not only is it easier to get an even outline with them, but the work is expeditiously performed. Large-leaved subjects, such as Laurel, must be trimmed with a knife. Clipping grass edges forms a considerable item in the summer routine in the garden. The grass edges should be gone over several times during the season, or the grass roots into the soil or gravel, and gives the garden a weedy and untidy appearance. The

Clingstone (see Glossary).

Chorocœa (see Linum).

clipping of dead blooms from the plants in the flower beds, and in the conservatory, also needs attention.

CLIPPING SHEARS.

The best make of clipping shears is double-handled ones built in the same way as an ordinary pair of scissors, with stout blades about 1' in length and 2½" broad. The shanks of the blades are bent slightly out of the straight, and form, with the blades, an angle of about 175°. They are inserted in stout wooden handles. These shears can be used for clipping grass edges, or places where the mowing machine will not touch, and for trimming small-leaved shrubs. They are not to be confused with the shears used for cutting grass edges; for these *see* EDGING SHEARS. An ordinary pair of sheep shears with a semicircular ribbon spring are very handy for light work.

CLITORIA.

Stove evergreen twiner (*ord.* Leguminosæ), producing handsome, Pea-shaped flowers. They may be raised from cuttings in heat under a glass, and will thrive in a mixture of peat, loam, and sand. The annual and some of the shrubby species may be raised from seeds sown in boxes in moist heat.

Principal Species :—

ternate, 4', Jy., bl. There are wh. and br. vars.

Other Species :—

arborescens, 8', Aug., pk.	heterophylla, 1', Jy., bl.
berteriana, 2', Je., yel.	lasciva, 4', Jy., bl.
(now <i>Periandra berter-</i>	mariana, 3', Aug., bl.
iana).	virginiana, 6', Jy., pur.
coccinea, 4', Jy., sc. (now	(now <i>Centrosema vir-</i>
<i>Periandra coccinea</i> .)	ginianum).

CLIVEUCHARIS.

A hybrid between a *Clivia* and a *Eucharis*, raised by M. van Houtte. *Eucharis amazonica* was the pollen parent. The plant needs similar treatment to a *Clivia*, with a little more heat, and is more a curiosity than of real horticultural value. It is interesting, however, as the forerunner of a possible race of hybrids between *Clivias* and *Eucharises*.

CLIVIA.

These splendid plants (*ord.* Amaryllidæ) with their handsome, strap-shaped leaves and heads of yellow and orange coloured flowers, are known in nearly every garden either under the name of *Imantophyllum* or *Clivia*. Practically all the garden varieties are forms of *Clivia miniata*, and a selection is given below. Propagation is easily effected by seeds or division; the former germinate readily in a warm temperature, and the plants should be placed singly in small pots. Rich loam and sharp sand form the best compost, and the plants can be fed with liquid manure when in active growth. Though *Clivias* will thrive in the greenhouse, they appreciate a slightly warmer and moister heat when approaching the flowering stage. They make good window plants. After blooming, the plants should be kept drier both in the air and at the roots, but must not be absolutely dried off.

Principal Species and Hybrids :—

cyrtanthiflora (miniata ×	yel. sc. (A selection of
nobilis).	excellent vars. is given
Gardenia, 1½', My., or.	on p. 224.)
yel.	— citrina, 2', Mch., yel.
miniata, 2', Feb., My..	nobilis, 2', Jy., red, yel.

Clitanthus (see Stenomeson).

A Selection of Garden Varieties :—

Distinction, or. sc., wh.	Martha Reimers.
Excelsior, or. red.	Mdme. Van Houtte, or.
Lady Wolverton, or. yel.	President, brilliant or.
Lindeni, pale or.	Prince of Orange, or. yel.
Marie Van Houtte, or. yel.	Superbum, or. red.

CLUSIA.

This genus of evergreen trees (*ord.* Guttiferae) requires stove treatment and a soil of rich loam, peat, and sand over perfect drainage. The trees may be increased from cuttings of ripe wood in very sandy soil under a bell-glass over bottom heat.

Principal Species :—

flava, 30', Jy., yel.	rosea, 30', Jy., red.; hlf-hdy tree.
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Other Species :—

alba, 30', Je., wh.	odorata, 25', Aug., ro. pk.
brongniartiana, 25', Jy., wh.	tetrandra, 20', Jy., wh.
	venosa, 25', Jy., wh.

CLUYTIA (*syn.* CLUTIA).

Evergreen greenhouse shrubs (*ord.* Euphorbiaceae) with small white flowers, but of little value for garden purposes. They are grown in loam, sand, and fibrous peat, and are propagated by cuttings of small side shoots or the tips of others struck in sandy soil under a glass. They require a minimum winter temperature of 40°, and one of from 55° to 75° in summer. The species named grow 2' to 3' high.

Principal Species :—

alaternoides, Jy.	polygonoides, Ap.
daphnoides, My.	pulchella, Je.
ericoides, Ap.	

CNEORUM.

A genus (*ord.* Simarubae) of greenhouse or half-hardy evergreen shrubs, propagated by cuttings of ripened wood in spring under a bell-glass, and thriving in two parts of loam, one part of leaf mould and sand.

Only Species :—

pulverulentum, 2' to 4', sum., yel.; powdery.	tricoccon, 2', sum., yel.; hdy. in the south.
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CNESTIS.

A small genus (*ord.* Connaraceae) of stove evergreen shrubs, requiring a compost of fibrous loam, peat, and coarse sand. Propagated by cuttings in sand under a bell-glass in bottom heat.

Principal Species :—

corniculata, 10', sum., pur.	glabra, 10', sum., grn., wh.
	polyphylla, 6', sum., pur.

CNICUS.

A large genus, mostly of hardy biennial or perennial plants, having a Thistle-like habit, and growing from 1' to 8' high. They form, according to the latest authorities, a somewhat heterogeneous group (*ord.* Compositae), including many species formerly known as *Cirsium*, *Chamaepeuce*, etc. Several are useful in gardens where sub-tropical effects are aimed at, and one, *C. Casabonae*, known as the Fish Bone Thistle, is quite commonly used

Clomnocoma (see *Dysodia*).
Cloudberry (see *Rubus chamemorus*).
Clove (see *Carnation*).
Clomesia (see *Catasetum*).
Club Moss (see *Lycopodium*).
Club Root (see *Cabbage Enemies*).

as a summer bedding plant, but it is not perfectly hardy in all gardens. Propagation is readily effected by seeds sown in cold frames or in the open ground in spring. They are best treated as biennials.

Principal Species :—

acaulis, 2', sum., pur.	eriphorus, 4', Jy., grey (<i>syn.</i> <i>Cirsium erio-</i> <i>phorum</i>).
altissimus, 8', Aug., pur.	giganteus, Jy., crim.
Casabonae, 2', Je., pur. (<i>syn.</i> <i>Chamaepeuce Casa-</i> <i>bonae</i>).	Grahamii, 5', Jy., crim. (<i>syn.</i> <i>Cirsium Grahamii</i>).
diacantha, 3', Je., pur. (<i>syn.</i> <i>Chamaepeuce dia-</i> <i>cantha</i>).	spinosissimus, 3', sum., yel.
	undulatus, 1', sum., pur.

Other Species :—

afer, Je., pur.	monspessulanus, Je., pur.
arachnoides, Jy., yel.	muticus, Je., red.
horridus, Jy., Aug., wh., pur.	ochroleucus, Jy., yel.

COAL.

The sort known as anthracite is extensively used for heating purposes in some gardens, and is very useful for reinvigorating a dull fire, or raising heat quickly on cold mornings. Whether or not it is superior to coke is an open question; but experiments carefully conducted by the writer tend to prove otherwise, as 112 lb. of anthracite was found to keep a fire in an hour less than an equal weight of coke, each kind of fuel keeping up the temperature equally well. As the coal cost three-pence per cwt. more than the coke, the latter proved more economical. However, the case is too important to be settled by one experiment, and the balance of evidence is claimed to be in favour of the coal.

COAL ASHES.

Very useful in the garden, but it is quite possible to have too many of them. Mixed with tar, or used alone, they form useful working paths when well rolled, and provide good standing quarters for pot plants in summer, allowing the free egress of water from the pot, and checking the ingress of worms. If incorporated with heavy land they mechanically render it lighter and more workable. They are often used in excess, particularly on Potato ground, for they lead to scab.

COBCEA.

Very beautiful greenhouse or conservatory perennial plants (*ord.* Polemoniaceae), with graceful habit and pretty flowers, and well suited for covering walls, trellises, or pillars. They are of rapid growth, and have bell-shaped flowers. They may be used with advantage for summer decoration outdoors. For this purpose they may be sown early and treated as annuals. Propagated by seeds sown in a gentle heat in spring, or by cuttings of the young shoots struck at the same season in light soil in heat. They make more vigorous growth in a rich soil, but a poorer one is advisable to check the tendency to make growth at the expense of flowers. Plants intended for outdoor work must be properly hardened off before planting out.

Principal Species :—

penduliflora, Dec., st. cl., grn.	able for outside in sum.
scandens, My., etc., cl., pur. (see p. 225). Suit-	— aurea marginata, pur., lvs. variegated.

Other Species :—

macrostemma, grh. cl., grn., yel. (<i>syn.</i> <i>lutea</i>).	stipularis, Oct., grh. cl., yel.
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COBURGIA.

Pleasing half-hardy bulbs (*ord.* Amaryllideæ), now included under *Stenomesson*. They are propagated by offsets, and may be grown either in pots or in a warm border in summer, lifting the bulbs in autumn and keeping them dry, like *Tigridias*, in winter, beyond the reach of frost. The species generally grown under the name of *Coburgia* is *incarnata* (*syn.* *S. incarnatum*), 1', red. Others are *acuta* (*syn.* *S. incarnatum* var. *acutum*); *coccinea* (*syn.* *S. coccineum*), 1½', red; *fulva*, 1', tawny yellow (a variety of *incarnatum*); *humilis* (*syn.* *S. humile*), 6", orange red; *trichroma*, 1', scarlet and yellow (a variety of *incarnatum*). *Versicolor*, red, white, and green, is also a variety of *S. incarnatum*.



Photo: Cassell & Company, Ltd.

COBŒA SCANDENS.

COCCOCYPSELUM (*syn.* COCCOCIPSELUM).

This genus (*ord.* Rubiaceæ) of soft-wooded stove trailers comprises several species, but is of no great horticultural value.

COCCOLOBA.

Fruit bearing stove evergreen trees (*ord.* Polygonaceæ), that carry large leaves, and grow best in loam and peat. Stock may be increased by cuttings of ripe wood in sandy peat under a bell-glass over bottom heat.

Coccinella (*see* Ladybird).

Principal Species :—

grandifolia, 20', Aug., wh.,
grn. (*syn.* *pubescens*).
platyclada (*see* *Muehlen-*
beckia platyclada).

Other Species :—

peltata, 30', Jy., sc.
tenuifolia, 30', Aug., grn.,
wh.

COCCULUS (*syn.* WENDLANDIA).

The economic value of these stove evergreen climbers (*ord.* Menispermaceæ), lies in their medicinal properties. They grow well in fibrous peat and loam, with sharp sand, and may be propagated from cuttings of firm growths in sandy soil under a bell-glass in heat.

Principal Species :—

laurifolius, 10', sum., wh.,
grn.
villosus, 6', sum., grn.,
yel.

Other Species :—

crispus, 10', sum., wh.,
grn. (now *Tinospora*
crispa).
Plukenetii, 10', sum., gr.,
yel. (now *Pachygone*
ovata).
suberosus, 20', sum., wh.,
grn. (now *Anamirta*
paniculata).

COCHLEARIA. (SCURVY GRASS.)

A genus of hardy annual or perennial plants (*ord.* Cruciferae), of little ornamental value. The most useful is *Armoracia*, the Horse Radish (which *see*). The native Scurvy Grass is *officinalis*, 6", May, white, there being also a variety *alpina*, which is dwarfer in growth. *Acaulis*, 6", April, lilac, is the only other worthy of mention. Common soil. Seeds of worth.

COCHLIODA.

Stove and greenhouse, evergreen, epiphytic Orchids (*ord.* Orchidaceæ); all natives of the Andes. Division of the pseudo-bulbs is the only practicable way of increasing stock, apart from the importation of fresh pieces. The compost may consist of fibrous peat two parts, live sphagnum moss, chopped, one part, a little sand, and a few small pieces of charcoal. All the species mentioned here make good basket plants for the cool house. They do well in the *Odontoglossum* house, provided they are not heavily shaded.

Principal Species :—

miniata, red, said to be a
natural hybrid between
noezliana and *vul-*
canica.
noezliana, 8", win., spr.,
cool house, or. sc., lip
with a yel. disc (*syn.*
noetzliana).
rosea, 8", win., ro. car., wh.
sanguinea, 8", aut., ro. pk.
vulcanica, 8", spr., dark
ro., pale ro. lip.

Other Species and Varieties :—

stricta, 8", ro.
vulcanica grandiflora, 8",
spr., dark ro.

COCHLIOSTEMA.

Handsome stove perennials (*ord.* Commelinaceæ) with long, deep green and purple leaves, and showy flowers; rare in cultivation.

COCHLOSpermum.

Azeredia, *Maximiliana*, and *Wittelsbachia* are all referred to this genus (*ord.* Bixineæ). Stove evergreen trees or shrubs, increased by cuttings of

Coccus (*see* Scale).

the matured shoots taken in spring, and rooted in sand in bottom heat; and by seeds, sown when obtained. Seeds produce finer plants than cuttings. Soil, equal parts of loam and peat, with sand. Firm potting.

Principal Species :—

Gossypium, 50', My., yel. (*syn.* *Bombax Gossypium*). A noble tree.

Other Species :—

orinocoense } probably not in cultivation.
vitifolium }



COCOS WEDDELIANA.

COCKCHAFFER.

The cockchafer (*Melolontha vulgaris*), known also as the May Bug, is a very destructive pest, though fortunately it confines its attentions more strictly to field crops than to those of the garden. In the larval or grub state it feeds underground upon the roots of young trees, lawn grass, and vegetables; and in the fourth year after hatching from its egg—years which it has spent entirely underground—it emerges as a full-grown beetle, and at once commences to make its presence felt on the leaves of various trees. The fact that the larvæ give no indication of their presence in the soil until such is furnished by the decay of the plant attacked, makes the application of any preventive or remedy very difficult. Where it is possible to break up infested land, this should be done, and the visits of insectivorous birds, such as starlings and rooks, encouraged. These much maligned friends of the gardener will, too, frequently extract the grubs from his lawns, appearing to possess some peculiar instinct which apprises them of the appearance of this dainty food. Trees the foliage of which is badly attacked may be cleared by shaking them over a white cloth. Poultry may be allowed to pick the fallen chafers up. Bats are fond of them.

COCKROACH.

The cockroach (*Stylophaga orientalis*) is a veritable nightmare to the grower of choice exotics, as it frequents the houses and nibbles off the roots, more especially the freely exposed ones of Orchids, and the species americana is if anything worse.

Some of the stronger spiders capture and dispose of cockroaches in their own peculiar way. A small quantity of phosphor paste spread on bread and butter, or even on pieces of slate or flower pots, will lure cockroaches on to a speedy death.

COCKSCOMB.

The name given to the peculiar inflorescence of *Celosia cristata*, on account of its resemblance to the ornamental appendage adorning the head of the farmyard cock. (For culture, see *CELOSIA*.)

COCOANUT FIBRE REFUSE.

A very useful auxiliary to the gardener. A mixture of the fibre and sand forms one of the best mediums in which to strike cuttings of soft-wooded plants. As plunging material it is unequalled, being light, sweet, and clean; moreover, it has the merit of serving again and again for this purpose. It is also extensively employed as a mulching for flower beds in summer, where, besides conserving the moisture about the roots of plants, it adds greatly to the appearance of the bed. The coarser particles, obtained by passing the fibre through a sieve, are often used for laying over the crocks in flower pots, but it is not safe practice.

COCOS. (Including *GLAZIOVA*.)

Description.—Noble Palms (*ord.* *Palmae*), important both from an economic and a decorative point of view. *Nucifera*, the Coconut, is an indispensable plant to the inhabitants of the tropics, and it is said that it alone is capable of furnishing all the necessities of human life. There is indeed no part of it but can be turned to account. It is only a moderate success under cultivation. (For the Double Coconut, see *LODOICEA*.) *Cocos weddeliana* is one of the most graceful of Palms, and, although it likes a stove heat, will last a long time in beauty in an ordinary dwelling-room. Under such conditions its leaves should be frequently sponged to free them from dust. Small plants, only 4" or 5" high, are in great request for small ornamental receptacles. For sub-tropical bedding *plumosa* is the most amenable species.

Propagation.—By seeds sown in stove heat, in sandy soil, or in a bed of Cocoonut fibre.

Soil.—Equal parts of peat and loam, with sand in the early stages; more loam for the older plants.

Other Cultural Points.—While *Cocoses* like plenty of moisture, both in the air and at the root, they are impatient of stagnant water, and the drainage must be perfect. Generally speaking, rather small pots give the best results. Firm potting is essential. The most troublesome insect is red spider, and it must be kept down by the consistent use of the syringe.

Principal Species :—

<i>nucifera</i> , 50', fronds 6' to 20', bright grn. Cocoonut Palm.	<i>weddeliana</i> (<i>see</i> figure), fronds 1' to 4', grn. above, grey below; drooping in habit. <i>Py-naertii</i> is a var. with broader pinnae (<i>syn.</i> <i>Leopoldinia pulchra</i> and <i>Glaziova elegantissima</i>).
<i>plumosa</i> , 40' to 50', fronds 3' to 15', dark grn. above, glaucous beneath; nearly erect in growth.	
<i>romanzoffiana</i> , 30' to 50', dark grn; not common.	

Cocoonut Tree (*see* *Cocos*).

Other Species :—

Bonnetii.
butyracea.
capitata, 10' to 15', fronds
6' to 8', pinnae erect.
Datil, fronds 12' to 16',
stem stout; a noble
Palm.
eriospatha.
flexuosa.
graminifolia, fronds 3',
almost stemless.
insignis.
leiospatha, fronds 3'.
Marie Rose (see proco-
piana).

Normanbyi (correctly
Ptychosperma Nor-
manbyi).
oleracea, 60' to 90'. The
buds are cooked and
eaten by the natives of
Brazil.
petraea, fronds 1½' to 3'.
procopiana, 15' to 18',
fronds 2' (syn. Marie
Rose of gardens).
Yatay, 12' to 18', fronds
6' to 10'.
Yurumaguas.

CODDLING.

A gardener's term, which is used contemptuously to denote the application of undue heat or care to a plant which would do better without it. Coddled plants are invariably leggy and spindly, and contrast very unfavourably with the sturdy, robust specimens produced under a cooler course of treatment. Coddling must not be confounded with "nursing," which is often resorted to to restore a plant whose health is somewhat precarious.

CODIÆUM.

This is a genus (ord. Euphorbiaceæ) of comparatively few species, but numerous garden-raised forms. They are known in gardens as Crotons, and in a popular dictionary such as the present they are dealt with under the familiar name. Some attempt is occasionally made in gardens to draw a distinctive line between the two genera by classing the broad-leaved types as Codiæums, and the narrow, twisted-leaved ones as Crotons. But strictly speaking all are Codiæums. (See CROTON.)

CODLIN MOTH (see APPLE ENEMIES).**CODONANTHE.**

Including Coccanthera, and part of Hypocyrtia (ord. Gesneraceæ). Stove herbaceous plants of creeping habit. They answer to the same treatment as Gesnera, which see.

Only Species Introduced :—

gracilis, Je., creamy wh. (syn. Hypocyrtia gracilis), thick, fleshy leaves.

CODONOPSIS.

Formerly Glosocomia. A genus of herbs (ord. Campanulaceæ) embracing twelve species, hardy or half-hardy. Increased by root division for the perennials; seeds for the annuals. Any good garden soil will do, but it should be well drained, and the position sheltered, though not shaded.

Principal Species :—

clematidea, 2' to 3', sum.,
hdy. per., wh., bl. (syn.
Glosocomia clemati-
dea). Regarded by
some botanists as a
var. of ovata.
ovata, 6'' to 12'', sum.,
hlf-hdy. per., pale bl.
rotundifolia, sum., hlf-
hdy., yel., grn; climb-
ing ann.
— grandiflora, larger
flowers than type.

Other Species :—

cordata (see Campanu-
ma javanica).
gracilis (see Leptocodon
gracilis).
lanceolata, 6'' to 12'',
sum., hlf-hdy. per.,
pale lil.; tuberous
rooted (syn. Cam-
panumæ lanceolata).

Cœlogyne (see Alchornea).
Cœlestina (see Ageratum).

CÆLIA (syn. BOTHRIOCHILUS).

Stove epiphytal Orchids (ord. Orchidaceæ) of some beauty. They answer to the same cultural treatment as Epidendrums.

Principal Species :—

baueriana, 1', Je., wh.,
fragrant.
bella, 1½'' to 2'', yel. wh.,
tipped ro. (syns. Bifren-
aria bella and Both-
rioichilus bellus).
macrostachya, 1½', Ap.,
red.
mooreana.

CÆLIOPSIS.

Epiphytal Orchids (ord. Orchidaceæ). They flourish under the same treatment as Epidendrums, which see. Hyacinthosma, white, crimson, and orange, has Pear-shaped pseudo-bulbs and delicious Hyacinth-scented flowers. It thrives in either a cool house or stove.

CÆLOGYNE.

Description.—Many species of this somewhat large genus (ord. Orchidaceæ) are very useful and



Photo: D. S. Fish, Edinburgh.

CÆLOGYNE PULCHELLA (see p. 228).

beautiful. Almost all are of low growth, with stems of distinctly creeping habit; on these stems the thick rounded or angular pseudo-bulbs develop from the new growths, each carrying a pair of green, strap-shaped leaves. Although a few species produce their flowers singly, the majority bear theirs in elegant pendulous or semi-pendulous racemes. In colour the flowers show considerable variation, but are mostly green, brown, or white. One of the most popular of Orchids is the charming Cœlogyne cristata, and it is one of the easiest

to grow, for it can be managed successfully in the same greenhouse as the equally popular *Cypripedium insigne*; for bouquets, buttonholes, wreaths, etc., *cristata*, its pure white variety *alba*, and its Lemon yellow marked form *lemoniana*, are very suitable, those of the type being quite common in florists' shops during February and March.

Culture.—Being low-growing and shallow-rooting Orchids, all the Cœlogyne are best grown in pans, rafts, or baskets, where ample drainage can be afforded, and a not too abundant supply of peat, loam, fibre, and sphagnum placed about their roots. Propagation is effected by division of the rhizomes, but whenever a specimen is divided or repotted sufficient room should be allowed for the



CŒLOGYNE DAYANA.

increase of at least a couple of years. Several species that will accommodate themselves to the conditions of the Odontoglossum house for the greater part of the year will be most successfully managed if placed in an intermediate temperature during the growing season; this applies to *asperata* and *speciosa*. Others, like *massangeana* and *dayana*—both of which have long, depending racemes (those of *dayana* being sometimes 5' long)—should be placed in baskets or suspended from the roof in the Cattleya or intermediate house. Few Cœlogyne appreciate great heat, but there is at least one exception, and that is *pandurata*, a most distinct and interesting species from Borneo; it is a strong-growing plant that requires a great deal of raft room and produces handsome, large, pale green flowers, heavily marked on the lip with black. This Orchid should be grown in the East

Indian house, in sphagnum and a little peat. The Pleione group require very different treatment, and are referred to under **PLEIONE**.

Watering and Syringing.—During warm, bright weather Cœlogyne not only need large supplies of water, but they love to be finely sprayed over by means of a syringe: syringing must, however, be discontinued early in the autumn. With the exception of the pretty Indian Crocuses—known to most gardeners as Pleiones, but now referred to Cœlogyne—the members of this genus are evergreen, and at no time of the year should they become dry at the roots, though it follows that less water is needed when growth has finished for the season than when roots and leaves are in full growth.

Principal Species:—

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| <i>asperata</i> , 9", My., grn.,
yel., red br. (<i>syn.</i> Lowii). | <i>massangeana</i> , 1', My., Je.,
pale yel., red br. |
| <i>barbata</i> , 1', Nov., Dec.,
wh. | <i>ocellata</i> , 8", Feb., Mch.,
wh. yel., br.; the var.
<i>maxima</i> has larger
flowers. |
| <i>cristata</i> , 10", Feb., Mch.,
wh., yel. The var.
<i>lemoniana</i> has a very
pale yel. mark on the
lip, but <i>alba</i> is purest
wh. | <i>pandurata</i> , 1½', My., Je.,
intermediatehouse, grn.,
veined blk. |
| <i>dayana</i> , My., Je., light
yel., br.; very long,
drooping spikes (<i>see</i>
figure). | <i>pulchella</i> , wh., blotched
br. (<i>see p.</i> 227). |
| <i>fuscescens</i> , 9", aut., br.,
red, grn. | <i>sparsa</i> , 6", Mch., wh., yel. |
| | <i>speciosa</i> , 9", sum., aut.,
st., yel., br. |
| | <i>Veitchii</i> , 6", Aug., wh. |

Other Species:—

- | | |
|----------------------------------------------------|------------------------------------------------|
| <i>corrugata</i> , 8", Aug., wh.,
yel. | <i>media</i> , 10", My., wh.,
yel. |
| <i>corymbosa</i> , 1', Jy., wh.,
yel., br. | <i>mayeriana</i> , 1', Sep., grn.,
blk. |
| <i>Cumingii</i> , 1', Jy., wh., yel. | <i>Mossiae</i> , 6", Mch., wh. |
| <i>elata</i> , 1', Ap., My., wh.,
yel. | <i>ochracea</i> , 9", Ap., wh.,
yel. |
| <i>flaccida</i> , 1', spr., wh., yel. | <i>odoratissima</i> , 10", win.,
wh. |
| <i>Foerstermannii</i> , 2', Jy.,
wh., yel., br. | <i>Sanderæ</i> , 8", Mch., wh.,
or. |
| <i>fuliginosa</i> , 1', Je., cream,
br. | <i>sanderiana</i> , 1', Jy., wh.,
yel., br. |
| <i>gardneriana</i> , 1', Nov.,
wh., yel. | <i>swaniana</i> , 1', Ap., wh.,
br. |
| <i>lactea</i> , 9", spr., cream,
yel., br. | <i>tomentosa</i> , 8", Jy., red br. |
| <i>lentiginosa</i> , 9", My., grn.,
wh., yel. | <i>viscosa</i> , 1', sum., wh.,
br. |

COFFEA.

Upwards of thirty species are placed in this genus (*ord.* Rubiaceæ). They are tropical, evergreen trees and shrubs, and though not showy are of the greatest value economically. *Arabica* was at one time the source of much of the coffee of commerce, but *liberica* has of late years been largely cultivated. The coffee it yields is little, if at all, inferior to the older Arabian coffee, and the plant grows in places where *arabica* will not; moreover, it is not so subject to the dreaded fungoid disease. Propagation is by cuttings, which in this country have to be rooted in sand, beneath a bell-glass in heat; also by seeds. Seedlings are less satisfactory than plants raised from cuttings. Soil, turfy loam and sand.

Principal Species:—

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| <i>arabica</i> , Sep., wh., frag-
rant. This plant has
points in common with
both <i>liberica</i> and <i>steno-</i>
<i>phylla</i> . | <i>liberica</i> , 10' to 16', wh.,
fragrant. |
| <i>bengalensis</i> , 5' to 15', wh. | <i>stenophylla</i> , 10' to 12'; a
valuable coffee yielder. |
| | <i>travancorensis</i> , 3' to 6',
wh., fragrant. |

COIX (*syn.* LITHAGROSTIS). (JOB'S TEARS.)

Rather curious Grasses (*ord.* Gramineæ), which in cultivation need heat. They are best treated as annuals—raised from seeds sown in heat in early spring, and planted out as soon as all danger from frost is past. The seeds are hard, pearly grey, and in request for ornaments. Any ordinary garden soil will suit. Four species in all are referred to the genus.

Principal Species :—

Lachryma-Jobi, 2' to 4' (*syn.* *lachryma*).

COKE.

The staple fuel for garden furnaces. It should be broken fairly small, and be stored in a dry place. It is generally purchased by the chaldron of 12 cwt., and should, where possible, be obtained and stored in summer for two reasons; firstly, because it is then much cheaper than in winter, and, secondly, because being purchased by weight it brings a greater bulk to the buyer by reason of its then being dry and light, whereas in winter it is wet and heavy. (*See also* HEATING.)

COLA (*syns.* LUNANEA and SIPHONIOPSIS).

Stove evergreen trees (*ord.* Sterculiaceæ), whose hard, dark brown seeds—the Cola or Goora nut—possess antitoxic qualities. The “nuts” when ground are employed by the natives to purify unwholesome water. There are half a dozen species. Increase is by cuttings of the ripened shoots, in sand, in brisk bottom heat, and by seeds. Soil, rich light loam, with a little rough grit.

Principal Species :—

acuminata, Jan., *yel.* Its value is wholly economic.

COLCHICUM. (MEADOW SAFFRON.)

Ornamental bulbous plants (*ord.* Liliaceæ), mostly hardy, and resembling the Crocus in appearance, hence erroneously called “Autumn Crocuses.” The greater number flower in autumn, and are valuable for beds, borders, and rock gardens. They make large corms, and the larger number produce broad, massive leaves in spring. The corms, or “bulbs,” are very poisonous. Propagation is by offsets, removed when the plants are at rest, usually as soon as the leaves turn yellow; also by seeds sown as soon as ripe, or in spring. A good, strong soil is favourable for the development of the large-flowered forms, but they can be grown in almost any soil. Colchicums should be planted as early as possible, and ought to be in the ground before the other autumn bulbs can be delivered. They may, however, be planted later.

Principal Species :—

autumnale, 9', Sep., *pur.* There are a number of forms which are better than the type. The best of these are *album plenum*, *purpureum plenum*, *roseum plenum*, and *striatum plenum*. Others are *album*, *atropurpureum*, *striatum*, and *foliis-variegatis* (*syn.* *croci-florum*).
Bornmülleri, 1', Sep., *pur.*, *wh.*; very handsome, and one of the best.
byzantinum, 6', Sep., *ro. pur.*; very pretty. Var. *cilicium* is fine.
Sibthorpii, 9', Sep., *wh.*, *chequered pur.* The best of the tessellated ones (*syn.* *latifolium*).
speciosum, 1', Sep., *lil.*, *pur.* A noble Meadow Saffron. *Rubrum* and

maximum are choice vars. There is a rare *wh. var.*
variegatum, 6', Sep., *wh.*,

Other Species :—

agrippinum, 3', Aug., *pur.*
alpinum, 3', Aug., *pur.*
arenarium, 3', Sep., *pur.*
Bivona, 6', Sep., *pur.*, *chequered*.
crociflorum (*see autumnale*).
Decaisnei, 9', Nov., *pur.*
fasciculare, 6', Oct., *wh.*, *pur.*
hydrophyllum, 6', *spr.*, *lil.*
lætum, 6', Sep., *wh.*, *lil.* (*syn.* *candidum*).

pur. A pretty chequered species (*syn.* *chionense*.) Var. *Parkinsoni* is good.

luteum, 6', *spr.*, *yel.*, *hlf-hdy.*
montanum, 4', Aug., *pur.*
 Vars. *hololophum*, *Ritchii*, etc.
neapolitanum, 6', Sep., *pur.*
procurrens, Oct., *lil.* (correctly *Merendera sobolifera*).
Troodii, Sep., *wh.*
umbrosum, 3', Sep., *pk.*

COLDENIA.

This genus (*ord.* Boraginæ) embraces about ten species of branching, procumbent herbs, distributed in both hemispheres. The plants are not showy, and procumbens is probably the only one cultivated. Propagation is by seeds sown in heat in March. A light, rich soil, such as loam and leaf mould in equal parts, with sand, is necessary.

Principal Species :—

procumbens, Jy., *wh.*

COLEA.

Nine or ten species of stove evergreen shrubs (*ord.* Bignoniaceæ). Cuttings of the matured shoots root readily if inserted in sandy soil in spring and plunged in brisk bottom heat. Afterwards the soil may consist of fibrous peat and loam in equal proportions, with sand and a few nodules of charcoal.

Principal Species :—

floribunda, 10', Aug., *mauritiana*, dark ro.
yel., *wh.* *undulata*, *yel.*, *lil.*

COLEBROOKIA.

A genus (*ord.* Labiatae) of evergreen greenhouse shrubs, clothed with thick, felt-like wool. The flowers are small and white, and the plants unimportant. Cuttings of the half-ripened shoots may be rooted in April under a bell-glass. Soil, two parts loam and one part leaf mould, with sand. *Oppositifolia*, 3' to 4', and *ternifolia* have been described as distinct species: now they are looked upon as being forms of one.

COLEONEMA.

Rather pretty greenhouse shrubs (*ord.* Rutaceæ), with small flowers, white for the most part. All the four species are natives of South-west Africa. They may be propagated by cuttings of tips of the side shoots put in sandy soil under a bell-glass, without heat. Soil, fibrous loam and peat in equal parts, with sand. A little pinching will be necessary to correct the rather straggling habit.

Principal Species :—

album, 1' to 2', *aut.*, *win.*, *juniperifolium*, 1' to 2'.
wh., *small.* *aut.*, *wh.* (*syn.* *juniperinum*).
aspalathoides, 6' to 3', *wh.*
aut., *wh.* *pulchrum*, 2' to 4', *aut.*, *red.*

Colax (*see* *Lycaste* and *Bifrenaria*).

Colbertia (*see* *Dillenia*).

COLEUS.

The Coleuses usually cultivated in our plant houses are the result of careful cross-breeding; very few of the species being considered sufficiently handsome to merit the attention of the gardener. No plant gives better results with so little trouble than the Coleus. Its magnificently coloured foliage imparts a charm to any glass structure during the warmer months of the year.



COLEUS MRS. TOLWORTHY.

The interesting species *thyrsoides*, introduced from Central Africa in 1897, assumes a branching habit with a little pinching, and produces long spikes of bright blue flowers at Christmas. The leaves are green.

Propagation.—Cuttings may be inserted at any time after the turn of the year, providing a minimum temperature of 55° to 60° can be maintained. Where conveniences do not exist for keeping Coleuses through the winter, very ornamental plants, in some respects equal to named varieties, can be raised from seed. This should be sown at the end of February or beginning of March in deep pans, well drained, and filled with a light compost containing plenty of sharp sand. Sow thinly, and place the pans in a temperature of 65° minimum, pricking off the seedlings when quite small into other pans, thence into small pots, until by the end of April they are ready for a shift into 4½" pots. Useful plants may be grown in this size; or they may be shifted on as growth demands into 6" and 8" pots. The strongest-growing plants are invariably those with a preponderance of green in their foliage, and these may be removed early from the seed pans and thrown away, retaining and potting up the weaker-growing varieties.

Other Cultural Points.—Growth is very rapid indeed under favourable conditions, and the plants

should be transferred to pots two sizes larger at every shift, until the maximum size is attained, using rich soil and potting firmly to ensure luxuriance of foliage with a short-jointed growth. Pinching is generally resorted to for keeping the plants bushy and shapely. Coleuses may, with care, be trained to cover a balloon- or umbrella-shaped trellis, and make very effective objects grown in this manner; or they may be trained to cover a wall in the stove or conservatory. In whatever manner grown, whether from cuttings or seeds, the fact should never be lost sight of that it is only when "rootbound," that is, the pots well filled with roots, that Coleuses assume their most gorgeous colours.

A Selection of Varieties:—

Baron Rothschild.	Pineapple Beauty.
Countess of Dudley.	Pride of the Market.
Decorator (see p. 231).	Tête d'Or.
Mrs. Tolworthy (see figure).	Vesuvius.

Some of the Species:—

<i>barbatus</i> , 2' to 3'.	<i>pictus</i> , 1½', grn., yel., br.
<i>Blumei</i> , wh., pur.	<i>scutellarioides</i> , bl., wh.
<i>Gibsonii</i> , pur.	<i>thyrsoides</i> , 3', Jan. to
<i>inflatus</i> , 3', lil.	Mch., bl.
<i>Mahoni</i> , 1½', Mch., pur.	<i>Verschaffeltii</i> , bronze foliage, useful bedder.

COLEWORT.

A quick-growing, immature Cabbage, which usefully fills the place of Cabbages proper at a time when these are not available. The Rosette Colewort is the sort generally grown, and three sowings are generally found sufficient to meet all demands. March, May, and July are the months for sowing, and the seedlings are grown in the same way as ordinary Cabbages, with the exception that they are planted so thickly as to allow of every other one being drawn for use, and still leave sufficient plants to yield a full crop. Eighteen inches between the rows, and 4" to 6" between the plants, is a reasonable distance at which to plant.

COLLABIUM.

Two species of stove terrestrial Orchids (*ord.* Orchidaceæ) constitute this genus. The flowers are borne in long, many-flowered racemes. Propagation is by division; and for soil, two parts of fibrous peat, one part of loam, and one part of chopped sphagnum, with sand, may be used.

Only Species:—

<i>nebulosum</i> .	<i>simplex</i> , grn., yel.
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COLLETIA.

Greenhouse or half-hardy shrubs (*ord.* Rhamnaceæ), with spiny branches. The petals are wanting, and the coloured calyx is the showy part of the flower. Increase is by cuttings of the half-ripened shoots in a close frame in spring. Soil, good sandy loam.

Principal Species:—

<i>cruciata</i> , 4', stem prickly	<i>sis</i> , horrida, and poly-
(<i>spus</i> , armata, bictonen-	acantha).
	<i>ulicina</i> , 2' to 4'.

COLLINSIA.

A genus of about eighteen species of pretty, hardy annuals (*ord.* Scrophularinaceæ), which are suitable for the decoration of the garden in summer or, if sown in autumn, in spring. Bicolor is a well-

Collania of Herbert (see *Bomarea*).

Collania of Schultes (see *Urceolina*).

Collembola (see *Springtails*).



THE BLUE WINTER-FLOWERING COLEUS THYRSOIDEUS

known annual. Propagated by seeds, sown in spring where the plants are to bloom, and thinned out to 2" or 3" apart. For early flowering sow in a sheltered place in autumn, protect in severe weather with branches or mats, and transplant in spring. Ordinary garden soil, previously well dug and manured, will do. Those sown in autumn should be in poorer soil during winter.

Principal Species :—

bicolor, 1', Aug., pur., wh. verna, 1', My., wh., bl.
— alba, wh. A pretty ann. in spr.
grandiflora, 1', Jy., pur.,
bl.

Other Species :—

bartsiaefolia, 1', Je., pur. parviflora, 1', Je., pur. bl.:
bicolor heterophylla, 2', trailer.
Jy., lil. sparsiflora, 1', My., vio.
corymbosa, 1', Jy., wh., bl. tinctoria, 1', My., pk.
multicolor, 1½', My., lil. violacea, 9'', Je., vio.

COLLINSONIA.

Perennial herbaceous plants (*ord.* Labiatae), little grown in gardens on account of their rather coarse habit. They like a rather moist and peaty soil, but will grow in any border. They are propagated by division in spring. The species grown are *anisata*, 2½', October, yellow; *canadensis*, 4', September, yellow (*syns.* *cuneata*, *decussata*, etc.); *scabriuscula*, 2', August, greenhouse, yellow (*syns.* *ovalis*, *tuberosa*, etc.); and *verticillata*. *Anisata* is barely hardy.

COLLOMIA.

Pretty, hardy annuals (*ord.* Polemoniaceae), related to, and somewhat like, the *Gilias*. They may be sown in spring or autumn; for autumn bloom where they are to flower; for spring in the reserve garden. The best are *coccinea*, 1½', June, red (*syn.* *lateritia*), and *grandiflora*, 1½', red yellow (*syn.* *Cavanillesii*, not *cavanillesiana* of D. Don). Others are *heterophylla*, 1½', July, purple, and *linearis*, 1½', June, yellow, brown. Common soil.

COLOCASIA.

Description.—Stove herbaceous plants (*ord.* Aroideae), with a tuberous rootstock. There are five species, all hailing from tropical America. The leaves are large and showy, and one species at least—*Antiquorum*—is cultivated for the sake of its edible rootstock, Taro.

Propagation.—By division of the rootstocks, in the same manner as is practised for *Caladiums*, which *see*.

Soil.—Equal parts of rich loam and leaf soil, with coarse sand.

Other Cultural Points.—*Antiquorum esculentum* is the form generally known in this country. Its huge leaves, nearly 2' in length by 18" broad, give it a noble presence, and the plant is much valued for sub-tropical bedding. The rootstocks are started in heat in early March, and grown on in a stove heat until all danger of frost is past. The plants may be grown in pots, but as they need a good deal of root room they are apt to be clumsy. Plenty of water is necessary throughout the growing season, and weak liquid manure is beneficial. The heavy leaves require artificial support.

Principal Species :—

Antiquorum, 2' to 3'.
— *esculentum*, 2' to 4', leaves round, heart shaped, of great size, grn., and with prominent wh. ribs. Formerly regarded as a distinct species (*syn.* *Caladium esculentum*).

— *nymphaeifolia*, stemless.
devansayana.
indica, 5' (correctly *Alocasia indica*).
odorata (*see* *Alocasia odora*).

COLOGANIA.

Stove creeping or twining shrubs (*ord.* Leguminosae). They may be increased by cuttings formed of the side shoots inserted in sandy soil, in heat; and by seeds sown under similar conditions. Soil, a mixture of loam, peat, and sand.

Principal Species :—

biloba, 20', sum., aut., *Broussonetii*, vio., flowers
vio. in pairs.

Other Species :—

angustifolia. *pulchella*.

COLORADO BEETLE.

This destructive beetle (*Doryphora decemlineata*) is well known in the United States. It was first discovered in the Rocky Mountains, in the Colorado district, whence the name. It was then observed to be feeding on a wild *Solanum*, but it has since transferred its attentions to the cultivated Potato. It reached the Atlantic coast in 1876, and is now common all along the eastern American coast. Alarm was taken in 1877 that it would spread to this country, and in that year the Privy Council passed an Act enjoining any person finding it to be present in his Potatoes to give notice to the local police. Also in 1877 the beetle was discovered at



COLEUS DECORATOR (*see* p. 230.)

Mülheim, on the Rhine, and in several localities in Saxony, and it was only by the vigilance and prompt action of the Government that it was got rid of. In 1901 the pest made its first appearance in England, being found at Tilbury, but the energetic action of the Board of Agriculture soon exterminated it. In America, spraying with Paris Green has been found effectual, and it is probable that

Colocynthis (*see* *Citrullus*).

Bordeaux Mixture would be equally efficacious. *Lygum Solani*, a beetle which attacks Potatoes in this country, is quite a different insect.

COLQUHOUNIA.

Elegant evergreen climbing shrubs (*ord.* Labiatae), suitable for pillars or the roof of a cool conservatory. There are three or four species. They may be increased by tips of the young, growing shoots in a light, gritty soil, under a hand-glass, in summer. Soil, loam, leaf mould, and sand in equal proportions.

Principal Species :—

coccinea, Sep., sc. (*syn.* — *vestita*, a very woolly tomentosa). form.

COLUBRINA.

An obscure genus (*ord.* Rhamnæ) of stove or greenhouse shrubs. They are of little value decoratively or economically, and hence are rarely to be seen in gardens. They may be propagated by cuttings, and like a soil chiefly composed of loam.

COLUMBINE (see AQUILEGIA).

COLUMELLIA.

Three species only represent this genus (*ord.* Columelliaceæ). *Oblonga*, 20', greenhouse, yellow, requires a mixture of loam, peat, and leaf mould, with a little coarse grit. It may be propagated by cuttings of the semi-mature shoots dibbled in sandy soil under a hand-glass in gentle heat in spring.

COLUMNÆA.

A genus of pretty stove evergreens (*ord.* Gesneraceæ). A few are climbers. *Aurantiaca* makes a nice basket plant, and does well if attached to a block of wood and frequently dipped. The rotten wood acts like a sponge, and holds a considerable quantity of water. Equal parts of peat and loam, with sand, form a suitable compost for the other species. (For general culture, see *ESCHYNANTHUS*.)

Principal Species :—

aurantiaca, Je., or. A handsome basket plant.
aureonitens, Sep., deep or. red.
erythrophæa, 2', Nov., red; large.

Other Species :—

hirsuta, Aug., Nov., pur., pale red.
rutilans, Aug., Sep., red, yellow; climbing shr.
scandens, Aug., sc.; climbing shr.
schiedeana, Je., yellow, br.; herbaceous cl.

COLURIA.

Hardy herbaceous perennials (*ord.* Rosaceæ), resembling the *Potentilla*. They are propagated by division in spring, or immediately after flowering, or by seeds in spring. The only species in cultivation is *potentilloides*, 1', June, orange yellow (*syns.* *geoides* and *Dryas geoides*). Common soil.

COLUTEA. (BLADDER SENNA.)

Ornamental shrubs (*ord.* Leguminosæ), hardy and deciduous, very useful for growing on poor, dry soil. They are also valued for their yellow flowers and the inflated seed pods which succeed them. They are easily raised from seeds sown in spring, or by cuttings inserted in sandy soil. Any common soil.

Principal Species :—

arborescens, 10', Je., Aug., yellow. Said to exist on the crater of Vesuvius.
cruenta, 6', Jy., red yellow. A pretty shr.

Colt's Foot (see *Tussilago*).

Other Species :—

armena.
halepica (see *istria*).
istria, 6', Je., yellow.
media, 6', Jy., or.
melanocalyx, 8', Je., Aug., yellow; a var. of *arborescens*.

COLVILLEA.

A genus (*ord.* Leguminosæ) of one species. It is a showy tree, but despite its beauty is seldom cultivated. It may be increased by cuttings of the ripened shoots dibbled in sand in a close frame possessing bottom heat; also by seeds. Soil, two-thirds loam, one-third leaf soil, and sand.

Only Species :—

racemosa, 40' to 50', Ap., My., st., sc.

COMACLINIUM.

The plant called *Comacclinium aurantiacum* is *Dysodia grandiflora* (*ord.* Compositæ), which is a half-hardy perennial with deep orange, Zinnia-like flowers, 2' to 3' high, and with habit and foliage resembling those of an African Marigold. Common soil. Seeds in spring, cuttings, or division. (Another *syn.* is *Clomenocoma montana*.)

COMBRETUM.

Tall, evergreen stove climbers (*ord.* Combretaceæ), with the exception of two shrubs, and producing scarlet, red, or white flowers in spikes, racemes, or panicles. Propagated by short side shoots taken off with a heel of the old wood, in sand, under a bell-glass or in a propagating case. Loam and peat in equal proportions suit, with sand to make the soil porous. Most of them do best planted out in well-drained borders and allowed to climb to the roof of tall houses. Winter temperature, 50° to 60°; summer, 60° to 90°.

Principal Species :—

coccineum, 20', Sep., sc.
(see p. 233) (*syn.* *Poivreia coccinea*).
elegans, 15', My., sc.
grandiflorum, 5', My., sc.; shr. (*syns.* *Azelii* and *Poivreia Azelii*).
latifolium, My., sc. (*syn.* *Poivreia macrophylla*).
pincianum, My., pur., red.
purpureum, 20' to 40', Sep., sc.

Other Species :—

Azelii (see *grandiflorum*).
barbatum, 10', wh.
comosum, 20', sc. (*syn.* *intermedium*).
decandrum, wh. (*syn.* *Poivreia decandra*).
farinosum, 10', My., or. red.
formosum, Mch., yellow, red.
intermedium (see *comosum*).
nanum, 2', wh.; shr.
paniculatum, 50', Sep., sc.
pilosum (*syn.* *Poivreia pilosa*).
racemosum, 12', My., wh.
sundaicum.

COMESPERMA.

Small evergreen shrubs (*ord.* Polygalææ). Propagated by cuttings of the side shoots under a bell-glass in early summer. Peat, fibrous loam, and sand. Winter temperature, 40° to 45°; summer, 55° to 75°.

Principal Species :—

coridifolium (see *erici-num*).
ericinum, 3', Je., pur.
gracile (see *volubile*).
virgatum, My., pur.
volubile, 3', Ap., bl. (*syn.* *gracile*).

COMFREY.

Comfrey (*Symphytum officinale*) is a native plant found plentifully beside ditches and watery

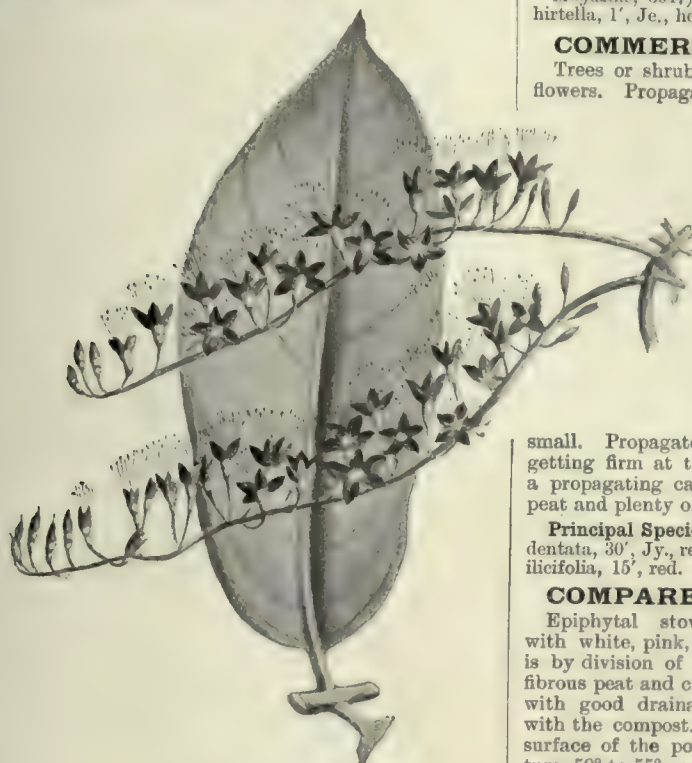
Colysis (see *Polypodium*).

Comaropsis (see *Rubus* and *Waldsteinia*).

Comarostaphylis (see *Arctostaphylos*).

Comarum (see *Potentilla*).

places. A variegated form is cultivated in gardens, as are the Bohemian Comfrey (*bohemicum*), Caucasian Comfrey (*caucasicum*), and the Roughest Comfrey (*asperimum*). The plants are all too coarse-growing for the ordinary bed or border, but make admirable subjects for naturalising in wild spots, or out of the way corners. Comfrey is used for feeding stock.



COMBRETUM COCCINEUM
(see p. 232).

COMMELINA.

Pretty, hardy greenhouse or stove perennial plants (*ord.* Commelinaceæ), of herbaceous or evergreen habit. They resemble in general appearance the Tradescantias, but have only three perfect stamens, instead of six. In mild localities *cœlestis* is hardy in dry soil, but in others it must be stored in sand in winter. Propagated by seeds of the annual and perennial hardy species, by division of the roots of the latter, and by cuttings of the greenhouse and stove species in a hotbed or frame with bottom heat. Soil, light, rich loam improved with manure or leaf soil. The greenhouse species thrive in an ordinary cool temperature, the stove plants requiring a minimum of about 40°.

Principal Species :—

cœlestis, 1½', Je., Jy., hlf-hdy., bl. (*syn.* *tuberosa*).
Very showy in a mass.
Var. *alba* is pretty.

Other Species :—

africana, My., grh. trailer, trailer, bl. (*syn.* *prostrata* and *cucullata*).
yel. (*syn.* *lutea*).
benghalensis, Je., st. communis, Je., st. trailer, bl.

cyanea, Jy., st. trailer, bl.
deficiens, 1', st., bl.
dianthifolia, Jy., st. cl., bl.
erecta, 3', Jy., hdy., bl.
fasciculata, 1', Jy., hlf-hdy., bl. (*syn.* *glabra* and *gracilis* of *Botanical Magazine*, 3047).
hirtella, 1', Je., hdy., bl.

nudiflora, 4' to 6', Aug., st. trailer, bl. (*syn.* *gracilis* [of Ruiz et Pavon], *deficiens* [of Flore des Serres, t. 1824], and *caroliniana* [Flora Caroliniana]).
obliqua, Je., st. trailer, bl.
scabra, 1', Jy., pur. br.
tuberosa (*see cœlestis*).

COMMERSONIA.

Trees or shrubs (*ord.* Sterculiaceæ) with small flowers. Propagated by cuttings in a propagating case, or under a bell-glass in heat. Soil, good fibrous loam, with sufficient sand to ensure porosity. The protection of a warm greenhouse is necessary.

Principal Species :—

dasyphylla (*see* *Rulingia pannosa*).
Fraseri, grh.
platyphylla, Je., st., wh. (*syn.* *echinata*).

COMOCLADIA.

Stove trees (*ord.* Anacardiaceæ) with a glutinous juice, turning black. Leaves pinnate, leathery, evergreen. Flowers in clusters,

small. Propagated by cuttings of young shoots getting firm at the base, and inserted in sand in a propagating case. Fibrous loam with a little peat and plenty of sharp sand.

Principal Species :—

dentata, 30', Jy., red.
ilicifolia, 15', red.

integrifolia, 15', red.

COMPARETTIA.

Epiphytal stove Orchids (*ord.* Orchidaceæ) with white, pink, or scarlet flowers. Propagation is by division of the pieces and by offsets. Soil, fibrous peat and chopped sphagnum in equal parts, with good drainage and plenty of crocks mixed with the compost. Keep the plants well above the surface of the pots or baskets. Winter temperature, 50° to 55°; summer, 60° to 80°.

Principal Species :—

coccinea, 1', Aug., sc.
cryptocera, 1', pk., cr.
falcata, 6", My., ro. (*see* p. 234).
— *rosea*.
macroplectron, 1', Oct., wh., ro. spot.
speciosa, 1', ochre, or.

COMPOSTS.

Composts fall naturally into three broad groups—(1) those suitable for soft-wooded plants, (2) for hard-wooded, and (3) for Orchidaceous and epiphytal plants generally. For soft-wooded plants a sound loam, containing a goodly proportion of sand, plenty of fibre, and of the sort known as yellow or hazel loam, should form the basis of all composts. This should be, where possible, the top spit of a common; or pasture land that has been laid down a number of years, and preferably grazed rather than mown. It should be dug during dry weather and stored in a square or oblong heap, grass side downwards, adding, in the case of poor quality loam, a layer of cow manure alternately with one of turves. In about twelve months' time this will form a splendid rooting medium for all kinds of soft-wooded plants, an addition of leaf mould (prepared by stacking leaves of Oak or Beech for at least twelve months), sharp sand, and dried

Common Swift Moth (*see* Moths).

animal or artificial manures, being made at the discretion of the gardener, who will be guided in regard to proportions by the needs of the plant for which the compost is prepared.

Good loam, freshly cut, may also enter into the composition of the soil for hard-wooded plants; in fact, some of them, like Camellias, grow remarkably well in freshly cut, sandy loam alone. In the majority of instances, however, loam must be made subservient to peat for hard-wooded plants. With coarse sand and small lumps of charcoal, peat forms a compost in which all hard-wooded plants thrive freely. A word of warning in regard to the use of manures with hard-wooded plants may here be inserted, it being demonstrated that peat, which is practically indestructible by water alone, sets up fermentation, and consequent decay, through the action of manure in contact with it. Those Orchidaceous plants which derive the greater part of their nourishment from the atmosphere only require as compost a moisture-holding, long-lasting mixture not easily impaired by the action of water. This is furnished by peat containing a high percentage of fibre, living sphagnum moss, charcoal in lumps to ensure sweetness, and occasionally pieces of broken crocks to promote porosity.

In the case of large plants of the soft-wooded section, it is unwise to sift the compost before using it, as small stones and fibrous lumps of loam tend to keep the soil open and ensure the free passage of water. Smaller plants, such as seedlings, may have their compost passed through a sieve to remove the coarser particles, a similar practice being followed in sowing seeds in pans, otherwise it is decidedly detrimental to use the sieve at all.

To determine whether the compost is in a proper state for use, squeeze a portion tightly in the hand. If it adheres slightly and then separates readily on being released, it is neither too wet nor too dry, but in a proper condition to enable the work of potting to be carried out with the best results.

CONANDRON.

The only species of this genus (*ord.* Gesneraceæ) is *ramondoides*, a scarce herbaceous perennial from Japan, resembling a *Ramondia* in appearance, and with pinkish or whitish flowers. Its hardiness is doubtful, and it should be protected by a frame in winter. It should be grown in a peaty soil, mixed with grit, and in shade. Propagated by division or seeds. It grows about 9" high.

CONANTHERA.

Pretty little bulbous plants (*ord.* Hæmodoracæ), half-hardy, but remarkably difficult to keep through our winters. They should be grown either in a border in front of a stove, and protected with a frame in winter, or lifted and kept in dry sand until spring. They are rare in cultivation, and of the three or four species, *bifolia*, 9" to 15", is the one usually met with. It has blue flowers in June. Light soil. Propagated by offsets.

Other Species:—

Simsii (*syn.* *campanulata*).

Forsteri.

CONCRETE.

Concrete may be formed of broken bricks, clinkers, stones, or coarse gravel, with cement. Six parts of either of these to one part of quicklime, or one part of coal tar to six parts of ashes or coarse gravel, form a very good and lasting

concrete walk. The material forming the bulk of the concrete should be of uniform hardness throughout, or ruts will quickly form in the softer portions—*i.e.* bricks or stones should be used alone, and not mixed together. An inch of gravel added before the concrete sets, and well rolled, materially adds to the appearance and durability of the walks.

CONDALIA.

A genus of about nine species (*ord.* Rhamnææ), the species occasionally cultivated being *microphylla*, a half-hardy evergreen shrub with prickly leaves, growing 2' high, and with green flowers. Common soil. Propagated by cuttings of partially ripened shoots. (For *Condalia* of Ruiz and Pavon, see *Coccosypselum*.)

CONDAMINEA.

Small stove trees or shrubs (*ord.* Rubiacææ) with thick, compressed branches. Propagated by cut-



COMPARETTIA FALCATA (see p. 233).

tings of firm shoots in a propagating case. Soil, fibrous loam and leaf mould, with sand.

Principal Species:—

tinctoria, 30', Sep., red.

Comptonia (see *Myrica*).

CONIFERS.

Cone-bearers; that is, trees and shrubs whose flowers are borne in the axils of bracts, more or less woody as a rule, and crowded together, forming a compound fruit termed a cone, not necessarily conical. Typical examples are Pines, Spruces, Silver Firs, Cedars, and Arbor Vitæ. The cone-scales of Juniper are few, and become more or less fleshy, forming a fruit termed a galbulus. Those of Cupressus are dry, but otherwise similar. The Yew has only one seed, surrounded by a few bracts at the base, and is sometimes made the type of a separate order; but it and the two previously mentioned genera are popularly classed with the Conifers on account of their evident affinity. The various members of the great class of Conifers are dealt with under their own titles.

CONIUM. (HEMLOCK.)

A poisonous, hardy biennial plant (*ord.* Umbelliferae). The only known species is *maculatum*, 5', June, white, a native plant easily recognised by its spotted stems. It is propagated by seeds sown in spring (*syns.* *croaticum*, *divaricatum*, *maeniosum*, *nodosum*, etc.). Exceedingly poisonous. *C. Arracacia* is *Arracacia* (or *Arracacha xanthorrhiza*); and *charophylloides* is *Seseli charophylloides*.

CONNARUS.

Evergreen stove shrubs (*ord.* Connaraceae) or small trees, with leathery, pinnate leaves and small flowers. Propagation, by cuttings of firm wood in sand placed in a propagating case. Soil, fibrous loam, a little peat or leaf mould, and sand to make the mixture porous (*syn.* *Omphalobium*).

Principal Species :—

<i>africanus</i> , 8'.	<i>nitidus</i> , 8', wh.
<i>asiaticus</i> (<i>see monocarpus</i>).	<i>paniculatus</i> , 8', wh.
<i>gibbosus</i> , 8'.	<i>pubescens</i> , 6', wh.
<i>monocarpus</i> , 8' (<i>syn. asiaticus</i>).	<i>semidecandrus</i> , 6'.

CONOCARPUS.

Evergreen shrubs of tree-like habit (*ord.* Combrataceae), requiring stove heat. Propagation is effected by cuttings of firm shoots inserted in sand in a case, or under a bell-glass in heat. Soil, fibrous loam and a third of peat with sand.

Principal Species :—

<i>acutifolius</i> (<i>see erectus acutifolius</i>).	<i>procumbens</i> , 1', yel.
<i>erectus</i> , 10', wh.	<i>racemosus</i> (now <i>Laguncularia racemosa</i>).
<i>acutifolius</i> , 10', yel.	

CONOSPERMUM.

Greenhouse shrubs (*ord.* Proteaceae), with evergreen foliage and white or blue flowers. Propagated by cuttings in sand placed under a bell-glass, with a little heat. Soil, one part loam, two parts peat, with plenty of sand.

Principal Species :—

<i>acerosum</i> , 3' to 4'.	<i>Huegelii</i> , 2'.
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CONOSTEGIA.

Small trees or shrubs (*ord.* Melastomaceae), requiring stove heat. Leaves large and three to five nerved. Flowers white, in terminal panicles. Propagated by cuttings of ripened shoots in heat. Soil, sandy loam and peat in equal proportions.

Coniogramme (*see Gymnogramme*).

Conoclinium (*see Eupatorium*).

Conophallus (*see Amorphophallus*).

Winter temperature, 50° to 55°; summer, 60° to 75°.

Principal Species :—

<i>balbisiana</i> (<i>see procera</i>).	<i>semicrenata</i> (<i>see Miconia semicrenata</i>).
<i>procera</i> , 12' to 20', Je., wh.	

CONOSTEPHIUM.

Greenhouse shrubs (*ord.* Epacridaceae) with small, evergreen leaves and berried fruits. The Tasmanian Cranberry and the Native Currant of Australia are species belonging to this genus. The berries are wholesome, though not much relished by Europeans. Propagated by cuttings in sand under a bell-glass. Peat and fibrous loam in equal parts, with sand. Winter temperature, 40° to 45°; summer, 60° to 70°.

Principal Species :—

pendulum, 6" to 18", Ap., red.

CONOSTYLIS.

Herbaceous perennials (*ord.* Hæmodoraceae), requiring greenhouse treatment like Anigozanthoses, to which they are allied, having similarly hairy flowers. Propagation, by division. Soil, sandy, fibrous loam. Temperature 40° to 45° in winter; 55° to 70° in summer.

Principal Species :—

<i>aculeata</i> , 1'.	<i>aurea</i> , 1', yel.
<i>americana</i> (now <i>Lophiola aurea</i>).	<i>dealbata</i> , 1'.
	<i>setosa</i> , Sep., yel.

CONRADIA.

Evergreen, dwarf stove shrubs, correctly referred to *Pentarhaphia* (*ord.* Gesneraceae). Propagation is effected by cuttings of mature side shoots in sand under a bell-glass or in a case. Soil, loam and peat in equal proportions, with plenty of sand.

Principal Species :—

<i>calycosa</i> (now <i>Pentarhaphia calycosa</i>).	(now <i>Pentarhaphia libanensis</i>).
<i>floribunda</i> , Oct., red sc.	<i>scabra</i> , 2', Jy., sc. (now <i>Pentarhaphia scabra</i>).

CONSERVATORY.

As the name implies, a conservatory is a structure used for the preservation of plants. Generally speaking, flowering plants are grown in other glass structures, such as hothouses or forcing pits, until their blossoms begin to develop, when they are taken to the cooler atmosphere of the conservatory, with a view to the extension of the flowering period over as long a time as possible. On no account should plants be retained in their forcing quarters until their blossoms are fully expanded, as their durability is considerably curtailed, and much of the pleasure to be derived from watching flowers expand is lost.

Proximity to the dwelling should form a powerful plea for thorough cleanliness and sweetness in the conservatory. No green, dirty pots should ever be admitted there; decaying leaves and flowers should be promptly removed as soon as noticed, and all plants unhesitatingly replaced by fresh ones, as soon as they cease to be beautiful. Superfluous moisture should be removed from the floors after watering is performed, as this makes for the comfort of visitors, and prolongs the existence of the blossoms, to which a close, moisture-laden atmosphere is injurious.

At least once a year the structure should receive a thorough scrubbing down from top to bottom, giving at the same time a thorough fumigation to

get rid of any lurking insect pests, which should never be tolerated in a conservatory. This cleaning and fumigating should be carried out when the residence is temporarily unoccupied, as, however carefully performed, the fumes have a nasty way of finding out places where their presence is not desirable.

Though conservatories should tend to preserve plant life, many are built more with an eye to ornament than utility, and are death traps for plants. In building, see that all is done that is possible to ensure the inmates keeping in good health for a reasonable time.

Where possible, the structure should face the south-east, as it then catches the early morning sun in winter, and in summer becomes comparatively cool and shady by the afternoon—the time when it is in most request by its owners. Plenty of ventilators should be provided at the top and sides, opening on as many different aspects as possible, so that air, which is essential to the plants' well-being, can always be given, no matter from what quarter the wind is blowing. Where possible, roller blinds for shading should be fitted; but in cases where the shape of the structure prevents their use, a wash of shading should be painted on the sunniest portion of the glass.

Climbers such as *Cestrum elegans*, *Fuchsias*, *Solanum jasminoides*, *Tacsonias*, *Passifloras*, *Plumbago capensis*, *Lapageria rosea*, and climbing *Roses* may be trained up the back walls and over the roof; beds may be formed and planted with *Camellias*, *Tree Ferns*, *Palms*, etc., or pot plants may be plunged in them; while large tubs containing *Agapanthus umbellatus*, *Clivias*, *Marguerites*, *Lemon-scented Verbena*, *Oranges*, or *Myrtles* are very desirable.

CONVALLARIA. (LILY OF THE VALLEY.)

(*Ord.* Liliacæ.) The chief plant belonging to the genus is *majalis*, the favourite Lily of the Valley, known to everyone, of which there are several varieties, including *prolificans*, very tall and robust; *flore pleno*, with double flowers; and *rubra* or *rosea*, with pink blooms. (For details, see LILY OF THE VALLEY.) Other plants called erroneously *Convallaria* will be found under *MAIANthemum*, *SMILACINA*, and *POLYGONATUM*.

CONVOLVULUS. (BINDWEED.)

Description.—A genus (*ord.* Convolvulacæ) containing plants of much beauty, as well as some of little value. There is much variety of habit among them, some being twining plants suitable for covering trellises, pillars, etc., while others are erect-growing, and some are of shrubby habit. As there are a very large number of recognised species, it is impossible to enumerate them all, and those which follow may be considered the best of the respective classes at present available. The plant known as *C. major* is *Ipomœa purpurea*.

Propagation.—The hardy perennials by division of the roots in spring, by seeds sown at the same season, and by cuttings of young growths; the annuals by seeds sown in spring; and the tender species by cuttings, rooted in heat under glass, or by seeds.

Soil.—The annuals and perennials will grow in any common soil, though they often prefer one lightened with leaf soil and sand. The tender ones like a compost of loam, leaf mould, and peat, with a dash of sharp sand.

Other Cultural Points.—Great care must be exercised in planting the hardy perennial species, which usually run badly at the roots, to prevent them from encroaching on other plants and taking possession of too much space. It may be necessary to confine the roots with stones or cement.

Principal Species :—

- | | |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| althaeoides, 3', Je., hdy. twiner, pk. | but rather shy blooming rockery plant. |
| arvensis, Bindweed, 3', Je., per., pk., wh. | major (now <i>Ipomœa purpurea</i>). |
| Cantabrica, 1', Je., hdy., pale red. | mauritanicus, Jy., bl. A charming basket plant, and hdy. in the south. |
| chinensis, 6', Jy., hdy. twiner, creeping roots, pur. crim.; a form of arvensis. | Of prostrate habit. |
| Cneorum, 1½', My., pk. A very handsome dwarf plant, with silvery leaves. Barely hdy., except in the south. | pannifolius, 15', Aug., bl. A pretty, twining grh. shr. |
| lineatus, 6', Je., red pur.; leaves silky. A pretty | tricolor, 1', Jy., etc. The well-known dwarf ann. Convolvulus, of which there is much var. of colour. |

Other Species :—

- | | |
|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| californicus, hlf-hdy., wh. or flesh. | lanuginosus, 6', Jy., cl., wh. |
| canariensis, 20', Je., grh. ev., pk. | macrostegius, hlf-hdy. sub-shr., creamy wh. |
| elongatus, Aug., ann. trailer, wh. | ocellatus, Aug., st. cl., wh., pur. eye. |
| erubescens, 6', Jy., grh. bien., pk. | pentapetaloides, 6'', Je., ann., bl. |
| evolvuloides, 15', Jy., grh. ann., red. | persicus, Je., per., wh. |
| floridus, 6', Jy., grh. per., wh. (<i>syn.</i> <i>Rhodorrhiza florida</i>). | Scammonia, Jy., per. twiner, pale pur. or wh. |
| Herrmanniæ, 5', Aug., grh. ev., wh. (<i>syn.</i> <i>crenatus</i>). | scoparius, 2', Aug., grh. trailing shr., wh. |
| incanus, 3', Jy., hlf-hdy. per., wh. (<i>syn.</i> <i>bonariensis</i>). | spithameus, 1', Je., wh. |
| | suffruticosus, 4', Jy., grh. twining shr., pk. (see also <i>Calystegia</i> and <i>Ipomœa</i>). |
| | tenuissimus, 6', Jy., hdy. twiner, lil. |

CONYZA.

A large genus of annual, biennial, or perennial, rarely shrubby, plants (*ord.* Compositæ). Propagated by seeds in the case of annuals and biennials; perennials by division. Soil, fibrous loam, leaf mould, and sand; hardy species, ordinary garden soil.

Principal Species :—

- | | |
|-----------------------------------|--------------------------------|
| ægyptiaca, st. | — ambigua, 1', Jy., ann., pur. |
| asperifolia, st., yel. | |
| chilensis, 2½', Sep., bien., yel. | |

COOPERIA.

Pretty little bulbous plants (*ord.* Amaryllidæ), with sweet-scented, starry, white flowers which open in the evening. There are two species—*Drummondii* (*syns.* *chlorosolen* and *mexicana*), 9", August, white, passing off red; and *pedunculata*, 9", August, white. They are hardy, with protection, in mild districts. Sandy soil; offsets and seeds.

COPAIFERA.

Evergreen trees (*ord.* Leguminosæ), requiring stove treatment. Propagated by cuttings of mature side shoots inserted in sand and placed

Cookia (see *Clausena*).

Cookia of *Gmelin* (see *Pimelea*).

in a propagating case. Soil, peat and fibrous loam in equal proportions, with sand. Winter temperature, 50° to 55°; summer, 60° to 75°.

Principal Species:—

gorskiana. Inhambane Copal.	Lansdorfii. Balsam of Copaiba.
guibourtiana. Sierra Leone Copal.	Mopane. officinalis, 20', wh. Balsam of Copaiba.

COPERNICIA.

Stove Palms (*ord.* Palmæ), with tall stems, and terminal heads of leaves. Propagated by imported seeds. Soil, loam two-thirds, and peat one-third, with sand.

Principal Species:—

cerifera, Wax Palm. hospita.	macroglossa. maritima.	Pumos. tectorum. Wrightii.
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COPROSMA.

Shrubs or small trees (*ord.* Rubiaceæ), grown for the sake of their foliage or their scarlet berries. Propagated by cuttings in sand under a bell-glass, but more quickly with bottom heat. Soil, two parts fibrous loam, one part peat, and plenty of sand. *Baueri variegata* and *B. picturata* are much used in bedding, either pegged down or as large plants; also for exhibition. Give greenhouse treatment.

Principal Species:—

Baueri, 3' to 10'.	along the middle (<i>syn.</i> Stockii).
— picturata, leaves yel.	— variegata, leaves margined yel.

Other Species:—

acerosa, 1', berries bl., trailer.	grandifolia.
Cunninghamii.	lucida, grh., greenish. robusta.

COPTIS. (GOLD THREAD.)

Very pleasing little plants (*ord.* Ranunculacæ) for the bog garden or a moist peat bed, and in a sheltered position, unless they can have a little protection in winter. Of the eight species the two best are *occidentalis*, 1', May, white; and *trifolia*, 6', April, white. Others are *asplenifolia*, 1', April, white; *orientalis*, 6', May, white; *anemonifolia*, and *brachypetala*. Division after flowering, or seeds sown in spring.

CORCHORUS.

Annual herbs (*ord.* Tiliacæ) requiring stove heat. Propagation, by seeds in March. Sandy loam and leaf mould will suit them. They should be grown in pots.

Principal Species:—

capsularis, 6', Je., yel. "Jute."	olitorius, 6', Je., yel. "Jew's Mallow."
japonicus (<i>see</i> Kerria).	

CORDIA.

Evergreen trees and shrubs (*ord.* Boraginæ), requiring mild stove heat. Propagation is by imported seeds; and by cuttings of firm young wood in a propagating case. Soil, loam, a third of peat, and plenty of sand.

Principal Species:—

decandra, 3', wh.; ornamental shr.	Greggii Palmeri, 5' to 10', wh.; fragrant.
grandiflora, Aug., wh.	

Corbularia (*see* *Narcissus*)

Other Species:—

Geracanthus, 30', My., wh. Spanish Elm.	Patagonula (<i>see</i> <i>Patagonula americana</i>).
glabra, aut., wh.	Sebestena, 30', Je., sc. (<i>syn.</i> speciosa).
ipomœæfolia, 20', wh.	superba, Sep., wh.
lævis, Sep., red.	
Myxa, 15' (<i>syn.</i> officinalis).	

CORDYLINE.

Description.—Stove or greenhouse plants (*ord.* Liliacæ), not branching much till they get old, but rising up till of Palm-like habit, with slender stems and a terminal tuft of evergreen and more or less leathery leaves. Being grown entirely for the sake of their fine foliage, the flowers are seldom seen. These are, however, ornamental. They are borne in very large panicles, are pure white, and fragrant.

Propagation.—By seeds, also by suckers. Several produce short, tuberous rhizomes, which ultimately give rise to suckers, but may be taken off and encouraged to develop into plants when repotting. The tops of tall, leggy plants are taken off and rooted in a propagating case, making serviceable young plants as soon as rooted. Old stems are also laid on the Cocoanut fibre refuse of propagating beds and kept moist, when they develop young shoots from dormant buds, these being taken off as cuttings and rooted in the usual way.

Soil.—Fibrous loam, with a fourth part of leaf mould and some sharp sand. Some cultivators use peat in a moderate quantity.

Other. Cultural Points.—*Australis* is hardy on the south coast of England, in many parts of Ireland, on the west coast of Ross-shire, and in the Scilly and Channel Islands. *Australis*, *Banksii*, *indivisa*, and others of the hardier species may be planted out in tall conservatories and winter gardens with fine effect. Winter temperature for stove species, 50° to 55°; summer, 60° to 80°. Winter temperature for greenhouse species, 40°.

For a fuller list of species and varieties, *see* *DRACÆNA*, the name under which they are usually to be found in gardens. A few of the principal species are named below; they will all be found, with others, under *DRACÆNA*.

Principal Species:—

<i>australis</i> .	<i>indivisa</i> .	<i>rubra</i> .	<i>terminalis</i> .
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COREMA.

Dwarf, Heath-like, hardy shrubs (*ord.* Empetracæ), similar and closely allied to the Crowberry (*Empetrum*). Propagation, by seeds, and by cuttings in sandy peat under a hand-light in a cold frame. Soil, peat, or ordinary garden soil mixed with half peat to retain moisture.

Principal Species:—

alba, 6" to 12", My., wh.; berries wh., Nov.	
Portugal Craneberry (<i>syn.</i> <i>Empetrum lusitanicum</i>).	
Conradii, 6" to 12", Ap., wh.; berries red, Aug. (<i>syn.</i> <i>Empetrum Conradii</i>).	

COREOPSIS.

Very effective annual or perennial plants (*ord.* Compositæ), with showy flowers, and well suited for the decoration of the garden and for supplying cut flowers. They are of easy culture. The annuals are often offered under the name of *Calliopsis*. Both annuals and perennials are propagated by seeds sown in a frame in March, or outdoors the following month; the perennials

also by division of the roots in spring or early autumn. *Grandiflora* should be raised from seed frequently, as old plants often die out. A light, but rich, sandy soil suits.

Principal Species :—

- | | |
|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Drummondii, 2', Jy., ann.,
yel., crim. | tinctoria, 2', Aug., yel.,
br. A favourite, varied
in colour. Atrospan- |
| grandiflora, 3', Aug., yel.;
beautiful per. (<i>syn.</i>
longipes). | guinea and bicolor are
handsome vars. |
| lanceolata, 2½', Aug., yel.;
good border per., re-
sembling auriculata. | verticillata, 2', Aug., yel.
A graceful border plant
with small flowers
(<i>syn. tenuifolia</i>). |
| steppia, 3', sum., yel. | |

Other Species :—

- | | |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| abyssinica, 2', sum., ann.,
yel. | integrifolia, 3', Jy., per.,
yel. |
| angustifolia, 2', Jy., per.,
yel. | latifolia, 3', Aug., per.,
yel. |
| aristosa, 2½', Sep., ann.,
yel. | maritima, 3', Aug., ann.,
yel. |
| atkinsoniana, 3', Aug.,
yel. (<i>syn. Calliopsis</i>
atkinsoniana). | nudata, 3', Aug., hlf-
hdy. per., yel. pur. |
| aurea, 2½', Aug., ann.,
yel. (<i>syn. arguta</i>). | palmata, 2', Aug., hlf-
hdy. per., yel. (<i>syn.</i>
præcox). |
| auriculata, 2½', Aug.,
per., yel. | rosea, 2', Jy., hlf-hdy.
per., red. |
| bicolor, 2½', Je., ann., yel. | senifolia, 3', Sep., per.,
yel. |
| coronata, 2', Jy., ann.,
yel. br. | trichosperma, 3', Aug.,
ann., yel. |
| delphinifolia, 3', Aug.,
per., yel. | Tripteris, 5', Aug., per.,
yel. (<i>syn. Chrysostem-</i>
ma Tripteris). |
| gladiata, 1', Sep., per.,
yel. | |

CORETHROGYNE.

A small genus of Californian plants (*ord. Compositæ*), allied to the Aster, and needing the same cultivation, except that they require a little protection in winter. The one introduced is *obovata*, 1', August, pink, which is almost covered with a white wool (*syn. spatulata*). Others are *californica* (*syn. incana*), and *filaginifolia* (*syn. tomentella* and *virgata*).

CORIANDRUM. (CORIANDER.)

The Coriander is *C. sativum*, a hardy annual plant (*ord. Umbelliferae*), which grows about 2' high, and bears white flowers in June, or later, according to the time when sown. Sow seeds in warm positions in spring and autumn; if leaves are wanted for flavouring soups, or for salads, sow at intervals. The seeds are used for confectionery. Common soil.

CORIARIA.

Ornamental hardy or half-hardy shrubs (*ord. Coriariæ*), which grow in common soil, and are propagated by layers, suckers, or cuttings in sandy soil under a bell-glass. The hardiest is *myrtifolia*, 6', June, green. Other species are *japonica*, 5', June, rose; *nepalensis*, 10', May, brown; *ruscifolia*, 3', June, green; and *terminalis*, which mainly differs from *nepalensis* in having flowers at the ends of the branches.

CORIS.

The only Coris in cultivation is *monspeliensis* (*ord. Primulaceæ*), which is 6" high, flowers in June, and has pretty, bright lilac flowers with orange anthers. It needs a dry, sunny place on a well-drained rockery, in light, sandy soil. Propagated by seeds sown in a frame in March.

CORK.

The hard, outer bark of a species of Oak (*Quercus suber*) much used for various domestic purposes. Sheets of virgin cork, so called because they have not been used, are in great request for various phases of decorative gardening. They are much used for covering window boxes, forming pockets for Ferns and other plants, and many kinds of rustic work. Many plants form cork on the surfaces of their stems, and this is the true nature of the substance with which a healthy plant covers wounds or abrasions of the epidermis.

CORNFLOWER (*see also* CENTAUREA).

The popular name of *Centaurea Cyanus* (*ord. Compositæ*), also sometimes named *Cyanus cyanus*.



COREOPSIS LANCEOLATA.

The wild plant bears flowers of one of the loveliest shades of blue that we have amongst a field of corn or in the garden. To distinguish it from other Cornflowers it is often termed the Blue Cornflower. Other names for it are Blue-bottle, Blue-cap, and Blue-bonnet. It is the German national emblem. In gardens a large number of varieties have been raised, ranging from white to the deepest blue and purple, with all intermediate shades. Victoria Dwarf Blue is a recently raised strain of dwarf (9") compact habit, with small, deep azure blue heads. It is easily raised from seeds sown in the open ground in any ordinary garden soil at the end of March or beginning of April, when it may be termed an annual. If sown as soon as the seeds are ripe, the seedlings will stand the winter like a biennial, and flower early.

Corethrostylis (*see Lasiopetalum*).

Cork Tree (*see Quercus*).

Cork Wood (*see Anona palustris*).

Corn (*see Glossary*).

Corn Flag (*see Gladiolus*).

Cornelian Cherry (*see Cornus Mas*).

Cornish Moneywort (*see Sibthorpia europæa*).

CORN SALAD.

Description.—Another name for this (*Valerianella olitoria*) is Lamb's Lettuce (*ord.* *Valerianæ*), and both refer to its use as a salad. It is chiefly valued in winter and spring, when other salad plants are generally scarce. Being a native plant it is very hardy, and may be found in abundance in certain districts in the cornfields and on sunny hedge banks. It is convenient to sow a supply in the garden for those who have a liking for it.

Propagation.—Those who desire to save their own seeds may make a sowing in August or September, and thin out the seedlings to 3" or 4" apart in the lines, which should be 6" to 8" asunder for convenience of hoeing to keep the ground clean. The plants will flower in May and June, ripening their seeds during July and August. Seeds are cheap, however, and easily obtainable. To keep up a succession for table use, seeds may be sown once a month, commencing in February and continuing to the first week of September.

Soil.—Any ordinary garden soil will answer the purpose; but the September sowing for winter and spring use should be made on a warm, sheltered border where the soil is rather light, facing the south so as to encourage growth in winter, when the leaves are most valuable. Give it a good watering occasionally, to maintain the succulent and tender character of the leaves.

CORNUS. (Dogwood.)

Valuable shrubs, trees, or small herbs (*ord.* *Cornacæ*), much valued for shrubberies and ornamental grounds. *Canadensis* and *suecica* are pretty for low, shady places in the rock garden, in peaty soil. Propagated by layers, cuttings,

suckers, and seeds. Common soil, except in the case of the two dwarf plants mentioned above. Several of the *Cornuses* have been found useful for planting under trees. They stand drip better than many other shrubs.

Principal Species :—

alba, 10', Jy., wh. A very handsome shr. The vars. *sibirica* variegata, *Späthii*, and variegata are exceedingly ornamental (*syn.* *tar-tarica*).

capitata, 10', Aug., wh. A very beautiful shr., with large flowers and Strawberry-like, inedible fruit. Only hdy. in the south and in exceptionally mild districts (*syn.* *Benthamia fragifera*).

florida, the "Flowering Dogwood," 15', Ap., wh. Very beautiful.

Other Species :—

alternifolia, 15', Jy., wh. (*syn.* *alterna*).

Amomum, 8', Aug., wh. (*syns.* *asperifolia*, *citrina*, *sericea*, etc.); vars. *angustifolia* and *grandifolia*.

Baileyi, 6', My., wh. *canadensis*, 6', My., pur. wh.; herbaceous.

candidissima, 10', Je., wh. (*syns.* *albida*, *stricta*, etc.).

circinata, 6', Jy., wh.

The var. *flore rubro* has red-tinged blooms. Var. *pendula* is graceful (*syn.* *Benthamia florida*).

Mas, 15', Feb., etc., yel. useful and pretty species, of which the following vars. are desirable: *aurea elegantissima*, *lanceolata*, *nana*, and variegata (*syn.* *mascula*). *Cornelian Cherry*.

sanguinea, the common Dogwood or Dogberry, 8', Je., grn., wh. When mature, the branches of this species are a dark red, and give a good win. effect. Berries blk.

(*syns.* *rugosa*, *tomentosula*, and *verrucosa*).

Kousa, 8', yel., red (*syn.* *Benthamia japonica*). *macrophylla*, Je., wh., var. *variegata* (*syns.* *brachypoda*, *religiana*, *theleriana*, etc.).

Nuttallii, 50', wh. *officinalis*, 15', Feb., yel. *stolonifera*, 10', My., wh.

Red Osier Dogwood. *suecica*, 6'', Je., pur.

Cornute (see *Glossary*).



Photo: Cassell & Company, Ltd

CORNUS ALBA, VAR. SPÄTHII.

CORNUTIA.

Evergreen shrubs (*ord.* Verbenaceæ), requiring stove heat and producing small flowers, followed by berried fruits, as in the case of *Callicarpa*. Propagated by cuttings in early spring in heat, under a bell-glass or in a case. The soil may consist of peat and loam in equal proportions, with sand.

Principal Species :—

punctata, bl. (*syn.* *Hosta* *pyramidata*, 6', Jy., bl. *cerulea*).

COROKIA.

Half-hardy shrubs (*ord.* Coriaceæ) of slender, much branched habit, with small, evergreen leaves. Propagated by cuttings in pots of sand under a hand-light in moderate heat; also by layers in autumn. Any well-drained garden soil will suit them. In the open they should have the shelter of a wall facing west. They may also be planted out in a cool conservatory or winter garden.

Principal Species :—

buddleioides, 10', yel. *Cotoneaster*, 10', yel.

CORONILLA. (CROWN VETCH.)

Pretty annual or perennial herbaceous plants or shrubs (*ord.* Leguminosæ), valued for the greenhouse, flower border, or rockery. The leaves are pretty, and the plants bear heads of small, Pea-shaped flowers. The hardy species are propagated by seeds sown in a frame in spring by division, and by cuttings of a few in spring, the cuttings being placed in a cold or slightly heated frame; the greenhouse species by cuttings in slight heat under a bell-glass or in a frame. Loam, with a little peat, is the most suitable soil for the greenhouse species, but the others thrive in common soil, except the Alpine plants, which should have loam, peat, and leaf soil in equal proportions.

Principal Species :—

cappadocica, Jy., trailer, A beautiful hlf-hdy. yel. A desirable rockery ev. plant, not hdy. every-
varia, Je., etc., trailer, pk., wh. A pretty but rather rampant plant, useful as a carpenter for very tall plants (*syns.* *Haussknechtii*, *hirta*, etc.).
iberica.
coronata, 2', Jy., yel. A pretty grh. shr.
glauca, 3½', My., etc., yel.

Other Species :—

argentea, 2', My., hlf-hdy. per., yel.
cretica, 1', Je., grh. ann., wh., red.
emeroides, My., etc., hdy. per., yel.
Emerus, 3', Ap., hdy. shr., yel. *Scorpion Senna*.
globosa, 1', Sep., per., wh.
junceae, 3', Je., hlf-hdy. shr., yel.
minima, 6'', Je., hlf-hdy. per., yel. (*syn.* *Clusii*).
montana, 6'', Je., hlf-hdy. shr., yel.
pentaphylla, 2', Je., grh. shr., yel.
valentina, 3', Mch., etc., grh. shr., yel. (*syn.* *suaveolens*).
viminalis, 3', Aug., grh. shr., pale red.

CORREA.

Description.—Evergreen shrubs (*ord.* Rutaceæ) with small, leathery leaves, suitable for a cool greenhouse or Heath house; formerly much more appreciated than at present. The leaves of *alba* were at one time used as tea by the settlers in Australia.

Propagation.—Take cuttings of the half-ripened

side shoots and insert them in sandy soil or sand, in pots, which should be plunged in the Cocoonut fibre refuse of a propagating bed and covered with bell-glasses. This should be done in the early part of summer. Some of the species root with difficulty, and *speciosa* scarcely at all. This, as well as others of slow growth which occasion any difficulty, should be grafted on young plants of the more common forms, such as *alba*.

Soil.—Use one part of good, fibrous loam and



CORREA CARDINALIS.

three parts of peat, with plenty of sand to make the compost porous.

Other Cultural Points.—Being of slow, stiff growth, they require no staking and little pruning; the stronger shoots only need stopping if inclined to destroy the symmetry of the bush. The woolly stems and leaves should be kept dry, but the roots just moist, as in the case of *Heaths*.

Principal Species and Varieties :—

alba, 6', Je., wh. (*syns.* — *backhousiana*.
cotinifolia and *rufa*). — *bicolor*, crim., tipped wh.
cardinalis, 3', Mch., se.; — *Harrisii*, crim.
handsome. — *major*, flowers larger.
lawrenciana, 3', Ap., gr., — *pulchella*, 5', Je., sc.
wh. (*syn.* *ferruginea*). — *ventricosa*, flowers inflated.
speciosa, 3', Je., sc. This and *cardinalis* are the most popular species.

Other Species :—

ferruginea (*see lawrenciana*). *longiflora*, Dec., hyb., ro. *rufa* (*see alba*).

CORTADERIA.

The Spanish name for the Pampas Grass, generally known by the name of *Gynerium argenteum*, and its congeners. They are described in this work under *Gynerium*. According to some authorities, *Cortaderia argentea* is the correct name of *Gynerium argenteum*.

CORTUSA. (BEAR'S EAR SANICLE.)

Pretty little perennials (*ord.* Primulacæ) for the rock garden, but requiring winter protection from damp. They are increased by division of the roots, or by seeds sown in a frame in spring, and grow in a soil composed of loam, peat, and sand. The species cultivated are *Matthioli*, 1', April, red; *grandiflora*, a variety of *Matthioli*, 1½', April, purple, very fine; and *pubens*, 6", May, magenta purple.

CORYANTHES.

A genus of Orchids allied to *Stanhopea* (*ord.* Orchidacæ) remarkable for the strange form of their flowers. Propagated by division of the pieces, and offsets. Fibrous Orchid peat and sphagnum in equal proportions, with the addition of finely broken crocks, make a suitable compost. The various species must be grown in Teak baskets under the warmest treatment given to Orchids, with plenty of atmospheric moisture, as well as water at the roots in summer, and a little less in winter.

Principal Species and Varieties :—

- | | |
|-------------------------------------------------------------|-------------------------------------------------|
| <i>macrantha</i> , 1', Je., grn., pur., vel., spotted crim. | — <i>Parkeri</i> , 1', Jy., vel., pur. |
| The best known and largest. | — <i>punctata</i> , 1', Je., vel., spotted red. |
| <i>maculata</i> , 1', Je., vel., spotted pur. | <i>speciosa</i> , 1½', My., vel., grn. |
| — <i>Albertinae</i> , 1', vel., spotted crim. | — <i>alba</i> , 1½', Je., wh. |

Other Species :—

- | | |
|------------------------------------------------------------------------------|-------------------------------------------------------|
| <i>Bungerthii</i> , grn., wh., spotted red, or. | <i>macrocors</i> , vel., streaked pur. |
| <i>elegantum</i> (<i>syns.</i> <i>elegantissima</i> and <i>macrantha</i>). | <i>mastersiana</i> , vel., spotted copper and claret. |
| <i>Fieldingii</i> , My., vel., br. | <i>macrostachya</i> , or., vel., br. |
| <i>lentiginosa</i> , My., vel. | <i>summeriana</i> , 1½', Jy., chocolate. |
| <i>leucocors</i> , grn., pur., wh. | <i>Wolfii</i> , vel., spotted pur. |

CORYCIUM.

Terrestrial greenhouse Orchids (*ord.* Orchidacæ), the cultivation of which has not yet been thoroughly mastered, the plants dying after a time. Increase by imported tubers. Soil, three parts fibrous peat, one part loam, with plenty of sand.

Principal Species :—

- | | |
|--------------------------------|--------------------------------------|
| <i>crispum</i> , 1', Jy., vel. | <i>orobanchoides</i> , 1', Jy., vel. |
|--------------------------------|--------------------------------------|

CORYDALIS. (FUMITORY.)

Desirable hardy perennial or annual plants (*ord.* Fumariacæ), with prettily shaped flowers, and of great value for borders and rockwork. Propagated by seeds in the case of the perennials and annuals; by division after flowering for the herbaceous; and by offsets for those with tuberous roots. They generally prefer a rather moist and peaty soil, but some will even thrive on a damp wall. *Lutea* is one of the best for a wall.

Principal Species :—

- | | |
|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| <i>bulbosa</i> , 6", Ap., pur. (<i>syn.</i> <i>solida</i>). Pretty in a damp, shady place. | handsome plant when well grown. |
| <i>lutea</i> , 1', My., etc., vel., var. <i>alba</i> . | <i>tuberosa</i> , 6", Mch., pur. |
| <i>nobilis</i> , 1' to 2', My., vel. | A tuberous species of which there is a nice wh. var. called <i>albiflora</i> (<i>syn.</i> <i>cava</i> of gardens). |
| Perhaps the most ornamental, and a really | |

Other Species :—**Tuberous-rooted :—**

- | | |
|-------------------------------------------------------------------------|------------------------------------------------------------|
| <i>angustifolia</i> , 1', Feb., pur. | <i>marshalliana</i> , 1', Feb., pur. |
| <i>bracteata</i> , 1', Feb., vel. | <i>pallida</i> , 1½', Mch., vel. |
| <i>caucasica</i> , 1', Mch., pur. | <i>rutæfolia</i> , 9", My., pur. |
| <i>fabacea</i> , 3', Mch., pur. (<i>syn.</i> <i>Fumaria fabacea</i>). | (<i>syns.</i> <i>bicalcarata</i> and <i>pauciflora</i>). |
| <i>Gortschakovii</i> , 1', My., vel. | <i>Semenovii</i> , 1½', My., vel. |
| <i>kolpakowskyana</i> , 6", Ap., pur. | <i>Scouleri</i> , 1½', My., pur. |
| <i>ledebouriana</i> , 6", My., pk. | <i>Sewerzovii</i> , 1½', Je., vel. |
| <i>longiflora</i> , 9", Ap., ro. | <i>tomentella</i> , 6", My., vel. |

Herbaceous :—

- | | |
|--------------------------------------|---------------------------------|
| <i>flavula</i> , 6", Je., vel. | <i>sibirica</i> , 1', Jy., vel. |
| <i>peoniaefolia</i> , 2', Feb., pur. | |

Annual and Biennial (the latter marked B.) :—

- | | |
|------------------------------------------|---------------------------------------|
| <i>aurea</i> , 1', Je., B., vel. | <i>ochroleuca</i> , 1', Jy., vel. |
| <i>breviflora</i> , 2', Je., vel. | (<i>syn.</i> <i>acaulis</i>). |
| <i>claviculata</i> , Je., cl., vel., wh. | <i>stricta</i> , 1', Je., B., vel. |
| <i>glauca</i> , 2', Jy., vel., pur. | <i>uralensis</i> , 1', Aug., B., vel. |



CORYDALIS NOBILIS.

CORYLOPSIS.

Hardy shrubs or small trees (*ord.* Hamamelidæ), much benefited by the shelter of a wall in all but the more favoured parts of the country. Flowers in advance of the leaves. Propagated by cuttings of half-mature wood in summer, in gentle heat; also by seeds when obtainable; and by layers in autumn. Any ordinary garden soil, well drained.

Principal Species :—

- | | |
|------------------------------------------------|---------------------------------------|
| <i>himalayana</i> , 20', Feb., Mch., primrose. | <i>spicata</i> , 6', Feb., Mch., vel. |
| <i>pauciflora</i> , 6', Feb., Mch., pale vel. | |

CORYLUS.

Hardy, deciduous shrubs or low trees (*ord.* Cupuliferae), grown for ornamental purposes, or for the sake of their Nuts, Filberts, or Cobs, as the different

fruits are named. (See also NUTS.) They are propagated by seeds (Nuts), layers, suckers, and grafting, the first for the reproduction of the species, and the other methods for multiplying the varieties. They will grow in any friable soil, fairly moist but well drained, a hillside for preference; but the land should be fairly fertile for fruiting plantations.

Principal Species and Varieties :

Avellana, 10', Feb. Common Hazel.	maxima, 10', Feb. (<i>syns.</i> tubulosa and Avellana rubra).
— aurea, lvs. golden.	— atropurpurea, lvs. dark pur. (<i>syns.</i> Avellana purpurea and A. atropurpurea).
— heterophylla, lvs. variously cut. Nettle-leaved Hazel.	
— pendula, a weeper.	
Columna, 10' to 30', Feb. The Constantinople Hazel.	

Other Species and Varieties :—

americana, 10', Ap. (<i>syn.</i> humilis).	maxima alba.
Avellana contorta, lvs. curled.	— barcelonensis, 8', Feb. Barcelona Nut.
— Lambertii, 10', Feb.	— crispa, 8', Feb. Frizzled Filbert.
— pumila, 6', Feb.	— tenuis, 10', Feb. Cosford Nut.
— rubra, 10', Feb.	rostrata, 5', Feb. Beaked American.
heterophylla, lvs. variously cut.	
mandshurica, 8'.	

CORYNELLA.

Stove evergreen shrubs (*ord.* Leguminosæ). Propagated by cuttings of half-mature side shoots in sand under a bell-glass, or in a propagating case. Fibrous loam two parts, and peat one part, with plenty of sharp sand, suit them:

Principal Species :—

polyantha, 5', pur.

CORYNEUM. (GUMMING FUNGUS.)

Stone fruits—that is, Cherries, Plums; Peaches, and their allies—are liable to gumming, otherwise termed gummosis. This is often caused by a fungus named *Coryneum Beijerinckii*, the mycelium of which penetrates the outer tissues of the host plant—that is, the cambium region—and sets up a ferment, whereby the protoplasm of the growing cells acquires new properties. The young cells (parenchyma) in turn secrete the ferment, with the result that their walls and contents are more or less changed to gum. This disease can be communicated to healthy trees, and only requires the bark to be injured or broken by frost after insufficient ripening of the wood, by accidental breakages, and by injudicious pruning. Prevention is better than remedy, and gardeners should avoid excessive cutting by pinching young shoots in summer where their presence is unnecessary. Lifting and root pruning, as well as planting in poorer soil, are means whereby excessive growth may be checked or prevented, so that the wood will ripen better.

CORYNOCARPUS.

This New Zealand tree (*ord.* Anacardiaceæ) is evergreen, and should be grown in the greenhouse in rich, loamy, well-drained soil. It may be propagated by layers or cuttings in light soil.

Principal Species :—

laevigata, 20', wh.. There is a golden form called aureo-marginata.

CORYNOPHALLUS.

A small genus (*ord.* Aroidæ) of stove tuberous perennials that produce very large spathes under cultivation.

Principal Species :—

Afzelii, 2', spr., pur., wh. spectabilis, 1½', spr., puce, pur., grn.

CORYNOSTYLIS.

A genus (*ord.* Violariæ) of stove perennial climbers that flourish in fibrous loam, peat, and coarse sand. They may be propagated by cuttings in very sandy soil under a bell-glass, in gentle bottom heat.

Principal Species :—

Aubletii, 10', sum., wh. Hybanthus, 10', sum., wh.

CORYPHA.

These are the well-known Fan Palms (*ord.* Palmæ). They attain to a considerable height in their native places. They grow best in the stove, in a mellow, sandy loam, and may be raised from seeds. The leaves grow upon the summit of the plant, and are handsome when clean and well grown.

Principal Species :—

australis (<i>see</i> Livistona australis).	umbraculifera, 100'. Tali-pot Palm. Lvs. 12'
decora (<i>see</i> Livistona inermis).	across (correctly Sabal blackburniana).
Gebanga, 60'. Fan Palm of Java.	Woganii (<i>see</i> Livistona Woganii).

CORYSANTHES.

These small terrestrial Orchids (*ord.* Orchidaceæ) are mostly found in Australia and New Zealand, and may be grown in a greenhouse in a mixture of peat, sand, and chopped sphagnum.

Principal Species :—

limbata, 3', aut., pur., wh. picta, 4', aut., pur., yel.

COSCINIUM.

A stove climber (*ord.* Menispermaceæ), that hails from Ceylon, where it is accredited with some medicinal virtues. It flourishes in peat and loam, and may be raised from cuttings in sand beneath a bell-glass over bottom heat.

Only Species :—

fenestratum, 10', Oct., Nov., grn.

COSMELIA.

This New Holland plant (*ord.* Epacridæ) grows best in fibrous, sandy peat, and is impatient of stagnant water. Cuttings root readily in summer in peat and sand beneath a bell-glass.

Principal Species :—

rubra, 1½', Je., red.

COSMIBUENA.

A small genus (*ord.* Rubiaceæ) of stove evergreen trees, which grow best in fibrous loam, peat, and sharp sand. Propagation may be effected by cuttings of ripe wood in sandy peat, beneath a bell-glass over bottom heat.

Principal Species :—

latifolia, 24', wh. obtusifolia.

Cusbaea (*see* Schizandra).

Cosmanthus (*see* Phacelia).

Cismidium (*see* Thelesperma).

COSMOS.

Beautiful annual or perennial plants (*ord.* Compositæ), prized for beds, borders, or conservatory decoration, and for cut flowers. Includes *Cosmea*. Propagated by seeds sown in slight heat under glass early in spring, pricked off into boxes and hardened off before planting out in May. *Scabiosoides* has tubers like a *Dahlia*, and may be lifted and kept in a similar way to it in winter. Soil, rich, well-manured loam.

Principal Species :—

bipinnatus, 3', Aug., pur.
There are several pretty vars. of this ann. The colours range from wh. to pur.
diversifolius, 3', Sep., lil.
The var. *atrosanguineus*,

sometimes called *Dahlia Zimapani* (a different plant), is pretty. Roots tuberous.

hybridus, 6', Sep., wh., ro., etc. Very attractive. Garden hybrids.



COSMOS BIPINNATUS.

Other Species :—

chrysanthemifolius, 2', Jy., yel.
crithmifolius, 2', Sep., yel.
parviflorus, 2', Jy., wh. (*syn.* *Coreopsis parviflora*).
scabiosoides, 3', Oct., sc.
sulphureus, 2', Jy., yel. (*syn.* *Coreopsis artemisiifolia*).
tenellus, 2', Oct., yel.
tenuifolius, 2', Sep., pur.

[All annuals except *scabiosoides*, which is a greenhouse tuberous perennial.]

COSSINEA.

An evergreen shrub (*ord.* Sapindacæ), flourishing in the stove. It grows well in well-drained loam and peat, and may be propagated by cuttings under a bell-glass in heat.

Principal Species :—

pinnata, 8' to 10', sum., wh.; golden veined lvs.

COSTMARY.

Though seldom cultivated nowadays, except in country cottage gardens for its medicinal virtues,

Costmary was formerly used largely in salads because of its bitter taste and aromatic odour. Its botanical name is *Tanacetum Balsamita*, and it belongs to what is popularly known as the Feverfew group of the order Compositæ. Under cultivation it succeeds best in a moderately dry position. Stock is increased by dividing the roots in autumn or sowing seeds in spring.

COSTUS.

A genus (*ord.* Scitamineæ) of stove herbaceous perennials, some of which produce strikingly handsome flowers. Division is the readiest mode of increase, and the plants grow well in fibrous loam three parts, peat one part, and coarse sand.

Principal Species :—

affer, 2', sum., wh., yel.
elegans, 3', sum., golden yel. (*syn.* *malortieanus*).
igneus, 3', aut., win., or.

yel. (The most popular species.)
speciosus, 3', Aug., wh.
spiralis, 4', Nov., sc. (*syn.* *Pisonis*).

COTONEASTER.

A valuable genus of about fifteen species of hardy shrubs or small trees (*ord.* Rosacæ), many of which are of great value for covering walls in either sunny or shady positions. The smaller species are fine on rockwork. Propagated by seeds sown as soon as ripe in nursery beds; by cuttings in spring or autumn, and by layers. Cuttings strike readily in the open or under a glass, without heat. Grafting on the commoner species is also practised. Common garden soil

Principal Species :—

bacillaris, Ap., wh. A tall species of erect growth. Used for walking sticks (*syns.* *laevis* and *obtusata*).
— *floribunda*.
buxifolia, 3', Ap., wh. A pretty plant for rockwork or low wall (*syns.* *hookeriana*, *repens*, etc.).
frigida, 10', Ap., wh., fruit red. A sub-ev. small tree (*syns.* *affinis* of gardens and *himalayensis*).

integerrima, 5', My., pk. The common *Cotoneaster* (*syn.* *vulgaris*, etc.).
microphylla, 4', Ap., wh. Probably the most valuable, with its wh. flowers, followed by sc. berries, against the ev. foliage (*see p.* 244). Var. *glacialis* is the proper name of *congesta*.
Simonsii, 6', Ap. A desirable garden species.

Other Species :—

acuminata, 4', Ap., pk. (*syns.* *royleana*, *Roylei*, and *Mespilus acuminata*).
affinis, 4', Ap., pk. (*syns.* *rosea* and *Mespilus affinis*).
horizontalis, Ap., ro. (*syn.* *davidiana*).
laxiflora, 5', Ap., pk.
multiflora, 4', My., wh. (*syn.* *reflexa*).

Nummularia, 10', Ap., wh. (*syn.* *Fontanesii*).
pannosa, 6', wh.
rotundifolia, 4', Ap., wh. (*syn.* *microphylla* *Uva-ursi*).
thymifolia, 1', Ap., wh.
tomentosa, 4', Ap., pk. (*syn.* *ericarpa*, etc.).
uniflora, My., wh. (*syn.* *Uva-ursi*).

COTTON. (See also GOSSYPIUM.)

Among textile fabrics cotton takes a foremost place, and its production affords occupation to many thousands of people. The material is woven from the silky-white, hairy covering of the seeds of several species of *Gossypium*; but the one mostly cultivated is herbaceous, which is represented by several varieties, notably *barbadense*,

Cossus Ligniperda (*see* Goat Moth).

so extensively grown in the West Indies and Southern United States. Commercially speaking, cotton cultivation is limited to those countries within 36° of either side of the Equator. Cotton was known and used in India at least 800 years before the Christian era; it was also known at an early period in the New World, as cotton cloth



COTONEASTER MICROPHYLLA (see p. 243).

has been found in the tombs of the Incas of Peru. Varying somewhat in height according to the climate, the cotton bush is generally about 3' high, and a field at harvest time is a pretty sight. A fine description of the cotton plant was given by the ancient historian Herodotus, who refers to a plant grown by the Indians, which bore wool like that of sheep, instead of fruit, and from which they made material for clothing.

COTYLEDON.

Description.—With such a cosmopolitan genus as Cotyledon (*ord.* Crassulaceæ), it is difficult to give a description that will fit all sections. Some species are hardy, and some require warm greenhouse treatment; some are annual, though most are perennial; some—as in the *Echeveria* group—are low-growing, flattish, or saucer shaped; while others notably the true Cotyledons, are succulent shrubs 3' or more high. That there is this wide difference is not difficult to understand when it is pointed out that under the title of Cotyledon all species formerly included under Cotyledon, *Echeveria*, *Pachyphytum*, *Pistorinia*, and *Umbilicus* are now grouped. All are succulent plants. Red and yellow are the predominating floral colours, while glaucous green is the general colour of leaf and stem.

Propagation.—All the annual species must be raised by sowing seed in light, sandy soil in the spring. Those that produce offsets freely can be easily increased by placing them in small pots. Most of the *Echeveria* group, so popular for carpet bedding, or as centre plants to other designs, may be increased by pulling off a few outer leaves in the autumn and laying them on sand on a dry greenhouse shelf, where, without any assistance whatever, they will form tiny plants at the base, which may be potted as soon as they can be conveniently handled. Cuttings should be laid on a dry shelf for a few days, to dry somewhat, before insertion.

Soil.—Lumpy, fibrous loam, mixed with plenty of coarse sand and crushed mortar rubbish.

Other Cultural Points.—All the Cotyledons require much the same treatment. A few are hardy, and such are indicated below. All the rest find a congenial home in a warm greenhouse, where the atmosphere is kept fairly dry throughout the dull winter months. No shading is necessary at any time, but during bright weather in spring, summer, and autumn an abundance of air is essential. Large pots are not needed, because few roots are formed, and these serve chiefly as anchors. Good drainage is imperative. A large supply of water may be given during the summer months, but during the remainder of the year an occasional watering will suffice. Drip or damp is the chief cause of failure with the whole family.

Principal Species:—

agavoides, 1', aut., dull
or. (*syn.* *Echeveria agav-*
oides).

atropurpurea, 1', aut.,
red, wh. (*syn.* *Echeveria*
atropurpurea).

coccinea, 2', Oct., sc. (*syn.*
Echeveria coccinea).

coruscans, 1½', Je., or.

fascicularis, 1', Jy., red.

fulgens, 1', Jy., red, yel.
(*syn.* *Echeveria fulgens*).

gibbiflora, 2', Sep., yel. pk.
(see p. 245) (*syn.* *Eche-*
veria gibbiflora).

— *metallica* (*syn.* *Eche-*
veria metallica. There
are several forms in cul-

tivation).
glaucia, 1', Sep., ro., yel.

lurida, 2', Jy., Oct., crim.,
sc. (*syn.* *racemosa* and
Echeveria racemosa).

orbiculata, 2', Jy., Sep.,
red. The plants grown

as *elata*, oblonga, ob-

ovata, ovata, ramosa,

Other Species:—

adunca, 3', Jy., yel., pk.
(*syn.* *Pachyphytum ro-*
seum).

cæspitosa, 1', Jy., yel.
(*syn.* *Echeveria cæsp-*
pitosa).

californica, 1', Jy., pale
yel. (*syn.* *Echeveria*
californica).

canaliculata, 2', Ap., red
(*syn.* *Echeveria canali-*
culata).

chrysantha, 1', Aug.,
cream (*syn.* *Umbilicus*
chrysanthus).

and *rotundifolia* are
vars. of this species.

ramosissima, 2', My., grh.,
pk.

retusa, 1½', Jy., Nov.,
crim., yel. A useful

plant, best represented
by its vars. *glaucia* and

floribunda splendens
(*syn.* *Echeveria retusa*).

secunda, 1', Je., Aug., red,
yel. A largely grown

species, the vars. *glaucia*
and *glaucia major* being

largely employed in
sum. bedding (*syn.* *Eche-*
veria secunda and

rosacea).

Sempervivum, 6'', Aug.,
Sep., red. Sometimes

confused with *Semper-*
vivum tectorum, which

is grown on roofs, on
walls, or in rock gardens

(*syn.* *Umbilicus Sem-*
pervivum).

clavifolia, 6'', Sep., pur.

Cooperi, 6'', Jy., pk.

Corderoyi, 1½', Jy., red,
yel. (*syn.* *Echeveria*
Corderoyi).

crenata (see *Kalanchoë*
crenata).

curviflora, 2', Oct., or.

desmetiana, 1', Jy., bright
red.

elata (see *orbiculata*).

gracilis, 1', Jy.

hemisphærica, 1', Jy.,
grn., wh., pur.

lanceolata, 6'', Jy., yel.
linguifolia, 1', Jy., yel.
(*syn.* Echeveria linguifolia).

maculata, 1', Je., wh.,
pur.
mamillaris, 1', Je., wh.,
pur.

nodulosa, 9'', Aug., yel.,
red.

nuda, 9'', Aug., yel., red.
ovata (*see orbiculata*).

Pachyphytum, 1', Jy.,
hdy., red (*syns.* Echeveria Pachyphytum and Pachyphytum bracteosum).

Peacockii (*syns.* desmetiana and peruviana).

Petalozæ, Je., ro.

platyphylla, 9'', Jy., wh.
(*syn.* Umbilicus platyphyllus).

pumila, 6'', Aug., yel.,

red (*syn.* Echeveria pumila).

racemosa (*see lurida*).
rosacea (*see secunda*).

rosea, 1', Ap., ro., yel.
(*syn.* Echeveria rosea).

Scheerii, 1½', Oct., creamy
yel.

spinosa, 1', Je., hdy., yel.

stolonifera, Aug., sc., yel.

teretifolia, 1½', Jy., yel.

tuberculosa, 1', Je., or.
(*syn.* Umbilicus tuberculosus).

turkestanica, 4'', Jy.,
hdy., wh., pur. (*syn.* Umbilicus turkestanicus).

Umbilicus, 6'', Je., hdy.,
yel. (*syn.* Umbilicus horizontalis).

The British Navelwort.

undulata, 1', Je.

velutina, 3', Jy., yel., red,
grn.

COUCH GRASS.

Couch Grass (*Triticum repens*) is a near ally of the cultivated Wheat plant, but the usefulness of its brothers must not be taken as a guarantee of its own, for it is one of the most troublesome weeds on the face of the earth. A heavy application of salt in hot, dry weather will temporarily clear it from gravel walks; but it returns reinvigorated thereby the next season. No remedy is thoroughly effective except digging every scrap of the creeping root up and burning it on the smother fire. Twitch and Squitch are names also applied to it. If not elegant, they are expressive.

COUROUPITA. (CANNON BALL TREE.)

Under cultivation, Couroupita guianensis (*ord.* Myrtaceæ) requires a roomy stove and a compost of loam, peat, and sand. The large fruits are like cannon balls, and they make a loud report when opening. The pulp is edible, and the shell is used in Guiana as a drinking vessel.

Only Species :—

guianensis, 15', Jy., Sep., wh., ro.

COUSINIA.

A genus of little grown annual, biennial, or perennial plants (*ord.* Compositæ), which can be grown in common soil, and are raised by seeds sown at the beginning of April in the open. The perennials can be divided in spring. Few are in cultivation, but *Hystrix*, 2' high, which is a hardy biennial and flowers in June, is sometimes seen. It has purplish blooms, and the leaves are covered with a cobweb-like wool. Others are *carduiformis*, *cynaroides*, *macrocephala*, *tenella*, *uncinata*, and *wolgensis*.

COUTAREA.

These stove evergreen trees (*ord.* Rubiaceæ) are very handsome, and have economic value, inasmuch as the Cinchona bark of British Guiana is the produce of the trees. They grow well in loam and peat, and spring cuttings root readily in sandy soil under a bell-glass over bottom heat.

Coulteria (*see Casalpinia*).

Principal Species :—

scherrfiana, wh.

speciosa, 12', Ap., pur.

(*syn.* Portlandia hexandra, *Jacquin*).

COUTOUBEA.

The two species of this genus (*ord.* Gentianæ) are respectively a stove annual and a stove bien-



Photo: Mr. R. L. Tucker.

COTYLEDON GIBBIFLORA (*see p.* 244).

nial. Both can be raised from seeds sown in heat and transplanted as may be necessary. Soil, loam and peat.

Principal Species :—

ramosa, 2' to 3', Jy., st.
ann., wh.

spicata, 2', Jy., st. bien.,
wh.

COUVE TRONCHUDA.

A fine vegetable (*Brassica oleracea costata*), sometimes called the Portugal Cabbage. It is not very commonly grown; in fact, it is only seen in

the gardens of the wealthy. The midribs of the leaves are very thick, white, and succulent, and when cooked in similar fashion to Seakale are excellent. The central heart is also available, and this differs little in flavour from an ordinary Cabbage. For an early crop, a sowing should be made in heat in mid-February, the seedlings being transferred to cold frames to strengthen, and subsequently placed in the open ground 3' apart each way. Successional sowings may be made in March and April. The plants are rich feeders, and nitrogenous manures should be given them freely. A dressing of 1 oz. per square yard of nitrate of soda is a capital dressing, and liquid farmyard manure is also beneficial.

COWANIA.

The chief member of this genus (*ord.* Rosaceæ) is a greenhouse evergreen shrub. It is somewhat difficult of propagation; cuttings should be inserted in sand under a bell-glass in gentle heat. The best soil is loam, peat, and sharp sand.

Principal Species :—

plicata, 2', Je., red.

COW DUNG.

Cow dung takes a foremost place among manures because, when associated with litter and urine, it is a complete fertiliser. One point in its favour is that it is not so fiery in its effects upon crops as are many chemical and animal manures. Cow dung is the most valuable for medium and light lands. It is also useful as an ingredient of potting soils, but for this purpose it should be stacked in layers with loam turves, or placed under cover where it will dry steadily previous to use. Scarcely any liquid manure is more calculated to assist crop production than that made with fresh cow dung, whether considered as a winter application for fruit trees, or a summer feeding for Vines, Figs, Begonias, Chrysanthemums, etc. Cow dung is the best mulch in early summer where the soil is light, because it holds a larger quantity of moisture than any other organic manure.

COWSLIP.

With its Primrose-like leaves, greenish white stem, and bright yellow, fragrant flowers, the Cowslip (*Primula veris*) is one of the prettiest of British woodland flowers. Ancient herbalists credited the Cowslip with medicinal virtues that are not recognised to-day. Cowslip wine is a pleasant and sparkling beverage, and is still made in those districts where the plant abounds and flowers freely.

CRAB.

The fruits of the wild Apple tree are popularly known as Crabs or Crab-apples, and the name has been derived from their sour and harsh taste, which usually causes the eater to make a wry or crabbed face. Crab-apple jelly is a preserve that generally finds favour owing to its distinct flavour. During recent years a race of garden varieties has been brought into being, and the beauty of their flowers, fruit, and autumn colour has won them a place in

our gardens. The Dartmouth, John Downie, Siberian, Imperial, and Transcendent Crabs are among the most ornamental of trees.

CRAMBE.

These are easily grown, hardy, herbaceous perennials (*ord.* Cruciferae) that appreciate rich, deep soil. They may be increased by seeds or division. Their greatest value lies in the fact that one or two are grown for food.

Principal Species :—

cordifolia, 5', My., wh.
junceæ, 2', My., wh.
maritima, 1½', My., wh.
The Seakale of gardens
(see Seakale).
orientalis, 4', Je., wh.;
fragrant.

pinnatifida, 3', Jy., wh.
Tatarica, 3', Je., wh. The
fleshy root of this plant
provides the so-called
Tartar bread, which is
largely consumed in
Hungary.



THE CRANBERRY.

CRANBERRY.

The British Cranberry, *Oxycoccus palustris* (*ord.* Vacciniaceæ), used to be very largely grown in the damper situations of England and Scotland, but the reclamation of such lands caused its rapid decline. The American Cranberry (*O. macrocarpus*) was similarly grown. The plants are hardy evergreens, and may be increased with ease by layering or division. A moist peat forms the most suitable soil.

Principal Species :—

macrocarpus, 9', My., pk. This, the American Cranberry, produces the finest fruits. There is a form with variegated lvs.
palustris, 6'', My., pk. The English Cranberry.

CRANIOLARIA.

An attractive greenhouse annual (*ord.* Pedalineeæ) that should be grown from seeds sown in light, rich soil.

Crane Fly (see *Tipula*).
Crane's Bill (see *Geranium*).

Covellia (see *Ficus*).
Cow Grass (see *Trifolium medium*).
Cow Parsnip (see *Hieracium*).
Cow tree (see *Brosimum*).

Only Species:—

annua, 1½', sum., pale yel., wh. (*syn.* *Martynia Craniolaria*).

CRASPEDIA.

Half-hardy annuals (*ord.* *Compositæ*), of which seeds should be sown in boxes in March, the seedlings being duly thinned and finally planted out of doors in rich, well-drained soil at the end of May.

Principal Species:—

Richea, 1', sum., yel. — *macrocephala*, 1½', sum., yel., wh.

CRASSULA.

Description.—In the main this is a genus (*ord.* *Crassulaceæ*) of South African plants which thrive best in the greenhouse. There are many scores of species, including annuals and herbaceous and shrubby perennials, but the number of those that have horticultural value is very limited. As a rule, they are grown for the beauty of their flowers, but a few have distinctiveness of leafage.

Propagation.—Increase is readily effected by cuttings of the upper portions of the growth in summer. Expose the selected portions to the sun for a day or two, and then insert them thinly in pots of loam, leaf mould, and sand. These will form neat plants, and will flower in the second season from insertion. Five or six will form a specimen in one large pot. The plants usually flower in alternate seasons.

Soil.—Two parts fibrous loam and one part leaf soil, with sharp sand and pounded bricks.

Other Cultural Points.—After potting, water must be given with judgment, or disappointment will ensue. After flowering, reduce the water supply, and in a few days cut the growths back to near the point of origin. A greenhouse is the best place during winter. When growth recommences repot, making the new soil firm about the roots. If large specimens are required, the growths must be judiciously pinched.

Principal Species:—

coccinea, 1' to 2', sum., sc. Known also as *Kalosanthes coccinea*. The correct name is *Rochea coccinea*.
jasminea, 1', Ap., My., wh. Smaller growing

than *coccinea*, and not requiring such large pots. This is correctly *Rochea jasminea*, but it is generally known in gardens as *Crassula*.

Other Species:—

arborescens, 2', My., pk.
columnaris, 6', Jy., wh.
ericoides, 6', Sep., wh.
lactea, 9', Sep., wh.
marginalis, 2', Jy., pale yel.

pyramidalis.
rosularis, 6', Jy., wh.
spatulata, 6', Aug., wh.
tetragona, 2', Aug., wh.
versicolor (*see* *Rochea versicolor*).

CRATÆGUS. (THORN.)

Description.—The Thorns (*ord.* *Rosaceæ*) are without rivals amongst trees of comparatively small stature for the embellishment of shrubberies and other portions of the garden. The large majority are white flowered, but they vary very considerably in the form, colour, and size of the fruit.

Propagation.—Seeds sometimes germinate quickly, at other times taking from two to three years. Specially good varieties may be perpetuated by budding or grafting upon the common White-thorn.

Soil.—These trees have the great merit of flourishing in any ordinary fertile garden soil or parkland.

Other Cultural Points.—All the species are hardy. One or two, notably *Pyracantha* and its varieties, display the remarkable beauty of their berries in winter when grown upon a wall. Superb specimens of *Pyracantha Lalandi* are frequently seen upon walls. *Pyracantha* thrives in towns.

Principal Species and Varieties:—

Azarolus, 15', My. Of vigorous habit; fruit large, red (*syns.* *Aronia* and *Mespilus Azarolus*).
coccinea, 20', My., wh. A superb tree; fruit brilliant red (*syns.* *acerifolia*, *rotundifolia*, *Halmia flabellata*, *Mespilus coccinea*, and *Phenopyrum coccineum*).
cordata, 15', Je., wh. Valuable for late flowering; fruit deep red (*syns.* *populifolia*, *Mespilus acerifolia*, and *M. cordata*).

Crus-galli, 20', My., wh. The Cockspur Thorn. Remarkable for the long, curved thorns; fruit deep red. There are several vars., notably *pyracanthifolia* and *splendens* (*syns.* *germanica*, *lucida*, *watsoniana*, and *Mespilus cuneifolia*).

Oxyacantha, 15', My., wh. to pk. The Common

Hawthorn. This has several sub-species and numerous handsome garden vars.

— *præcox*, 15', My., wh. The Glastonbury Thorn. Everyone will have read the legend that this Thorn sprang from the walking-stick of Joseph of Arimathea when it was thrust into the ground.

— *punicæ flore pleno*, 20', My., sc. Paul's Double Scarlet Thorn, a magnificent tree.

Pyracantha, 10', My., wh. The Fiery Thorn. The var. *Lalandi* is most valuable for walls (*syns.* *Cotoneaster Pyracantha*, *Mespilus Pyracantha*, and *Pyracantha coccinea*).

tanacetifolia, 15', Je., wh. The Taney-leaved Thorn. Fruit yel. Does well in towns (*syn.* *Mespilus tanacetifolia*).

Other Species:—

alnifolia (*see* *cuneata*).
apiifolia (*see* *viridis*).
arborescens (*see* *viridis*).
brevispina (*see* *Douglasii*).
caroliniana (*see* *flava*).
carpathica (*see* *nigra*).

coccinea glandulosa (*see* *mollis*).

crenulata, 10', My., wh. (*syns.* *Pyracantha crenulata* and *Mespilus crenulata*).

cuneata, 15', My., wh. (*syns.* *alnifolia* and *Mespilus cuneata*).

Douglasii, 15', My., wh., pur. berries (*syns.* *brevispina*, *rivularis*, and *Anthomeles Douglasii*).
elliptica (*see* *tomentosa*).
flabellata (*see* *orientalis*).

flava, 20', My., wh., yel. berries (*syn.* *caroliniana*, *glandulosa*, *turbinata*, *Mespilus caroliniana*, and *Phenopyrum carolinianum*).
glandulosa (*see* *flava*).

heterophylla, 20', My., wh., red berries (*syns.* *multiflora*, *Mespilus Aronia*, *M. constantinopolitana*, and *M. heterophylla*).

lambertiana (*see* *melanocarpa*).

latifolia (*see* *punctata*).

Loddigesii (*see* *punctata*).

Melanocarpa, 15', My., wh., blk. berries (*syns.*

lambertiana, *oliveriana*, *Pallasii*, and *platyphylla*).

mexicana, 15', My., wh. (*syn.* *Mespilus mexicana*).

microcarpa (*see* *spatulata*).

mollis, 20', My., wh., red berries (*syns.* *coccinea mollis*, *c. glandulosa*, *texana*, *urasina*, *Mespilus tiliaefolia*, *Phenopyrum subvillosum*).

multiflora (*see* *heterophylla*).

nigra, 20', My., wh., blk. berries (*syns.* *carpathica*, *versicolor*, and *Phenopyrum nigrum*).
obovatifolia (*see* *punctata*).

oliveriana (*see* *melanocarpa*).

orientalis, 15', My., wh., dark red berries (*syns.* *flabellata*, *odoratissima*, *schraderiana*, and *Tournefortii*).

Pallasii (*see* *melanocarpa*).

pentagyna, 15', My., wh. (*syn.* *Mespilus pentagyna*).

platyphylla (*see* *melanocarpa*).

punctata, 15', My., wh. (*syns.* *latifolia*, *Loddigesii*, *obovatifolia*, *Halmia cornifolia*, and *Mespilus punctata*).

purpurea (see *sanguinea*).
rivularis (see *Douglasii*).
sanguinea, 15', My., wh.,
 crim. berries (*syns.* *pur-*
purea altaica and
spinosissima).
schraderiana (see *orient-*
alis).
spathulata, 15', My., wh.
 (*syns.* *microcarpa*, *vir-*
ginica, *Cotoneaster*
spathulata, and *Mes-*
pilus spathulata).
spinosissima (see *san-*
guinea).

tomentosa, 20', My., wh.
 (*syns.* *elliptica*, *Hal-*
mia tomentosa; and
Mespilus tomentosa).
texana (see *mollis*).
trilobata (see *viridis*).
turbinata (see *flava*).
urasina (see *mollis*).
versicolor (see *nigra*).
virginica (see *spathulata*).
viridis, 15', My., wh., grn.
 berries (*syns.* *apiifolia*,
arborescens, and *trilo-*
bata).

CRATÆVA.

Stove evergreen trees (*ord.* *Capparidæ*) that thrive in rich loam with peat and sand. They may be propagated from cuttings under a bell-glass over bottom heat.

Principal Species :—

gynandra, 10', My., wh.
 The bark of the root of
 this plant blisters like
Cantharides. "Garlic
 Pear."
religiosa, 14', My., wh.
 (*syn.* *Roxburghii*).
Roxburghii (see *religiosa*).
Tapia, 30', My., wh.
tapioides, 20', My., wh.

CRAWFURDIA.

A small genus (*ord.* *Gentianæ*) of half-hardy or cold greenhouse herbaceous twiners. They may be increased by division, and grow well in rich, moderately strong soil.

Principal Species :—

fasciculata, 4', Aug., bl.

CREEPERS.

These are hardly represented in the garden to the extent they merit, considering the numbers of beautiful subjects to be found among them, and their suitability for converting bare and ugly fences, walls, or arches into monuments of luxuriance and beauty. However, it is kinder to leave them entirely alone than to put them in unsuitable soil, against a hot, dry wall, and then leave them to struggle unassisted against adverse circumstances, as is so often the case. Given a good bed of rich soil, and treated on the assumption that a wall is a terribly moisture-absorbing companion, which appropriates far more than its own share of rains and dews, no class of plants will better repay the cultivator for his trouble. A good soaking at the roots occasionally, a spraying with the syringe in very dry, hot weather, an occasional fastening in position, with an annual thinning or pruning, are all the creeper asks in exchange for its wealth of blossom—a wealth often supplemented by a gorgeous crop of berries or beautiful evergreen leaves. A few of the most suitable plants for various aspects are named, but the colour of the wall should be considered in relation to that of the flowers selected, so that incongruity may be avoided. It may also be noted that the word "creeper" is dealt with in its popular sense.

For the east wall, we may select from the beautiful Ayrshire and evergreen Roses; *Cratægus Lalandi*, orange berried and evergreen; *Cotoneaster microphylla*, with the same recommendations; *Cydonia japonica*, crimson flowers; common Virginian Creeper, green Ivies, and the yellow-flowered *Forsythia suspensa* and *Jasminum nudiflorum*.

For the South Wall.—*Passiflora cærulea*, and its white variety *Constance Elliott*; *Clematis Princess of Wales*, *C. Beauty of Worcester*, and *C. Duke of Edinburgh*; *Escallonia macrantha floribunda*, red flowers; *Vitis inconstans* (*Ampelopsis Veitchii*), the self-clinging Virginian Creeper; *Wistaria sinensis*, purplish blue, flowers in hanging racemes; and *Roses* such as *Gloire de Dijon*, *Maréchal Niel*, and *W. A. Richardson*.

For the West Wall.—*Clematis montana*, white; *C. Jackmanii*, purple; *Vitis vinifera purpurea*, leaves bronzy red; *Chimonanthus fragrans* var. *grandiflora*, *Garrya elliptica*, *Jasminum officinale*, white, and *Vitis inconstans*.

For the North Wall.—Fewer subjects are here available, but the common Virginian Creeper succeeds fairly well. *Cratægus Pyracantha*, *Calycanthus occidentalis*, *Rose Homère*, and any of the strong-growing green Ivies will do. For adorning arches, fences, and garden walls a selection may be made from the following: Common and variegated Hops, Canary Creeper, Everlasting Peas, *Convolvulus*, *Tropæolum majus* and *T. lobbianum*, Virginian Creeper, *Clematis Jackmanii* and *C. montana*, *Aristolochia Sipho*, *Cobæa scandens*, *Lonicera Caprifolium*, *Jasminum officinale*, and *Roses Aimée Vibert*, *Félicité Perpetue*, *Bennett's Seedling*, *Crimson Rambler*, *Dundee Rambler*, and *The Garland*. (See also CLIMBERS.)

CRESCENTIA.

A genus (*ord.* *Bignoniaceæ*) of evergreen trees that may be grown in deep, rich loam and peat, in the stove. Propagation may be effected by cuttings in sand under a bell-glass over bottom heat.

Principal Species :—

Cujete, 20', wh. The pleasant. The hard,
Calabash tree. Some woody shells are used
 fruits globose, others for spoons and ladles,
 bottle-shaped; the as they stand fire
 flavour is not very remarkably well.

Other Species :—

alata, 10', lil. (now *Par-* *macrophylla*, 8', grn. yel.
mentiera alata). (now *Amphitechna*
cucurbitina, 10', wh. *macrophylla*).

CRESS.

Three varieties of Cress (*Lepidium sativum*) are in cultivation for use in salads. The Broad-leaved form has given place to the Plain-leaved and Curled varieties, the latter being used largely for garnishing. Cress is not quite so easy to manage as the stronger-growing Mustard, but it requires similar treatment. Being slower growing than Mustard, it must be allowed four or five days longer if both are needed at the same time. Cress has a more delicate flavour than Mustard, but it is not grown nearly so much commercially as the latter.

CRESS (WATER).

The Watercress industry is an extensive one, for there is no salading more popular with the general public, and scarcely another that can be purchased cheaply the whole year round. So hardy and so free-rooting is the Watercress (*Nasturtium officinale*) that anyone may grow it in a bowl of water or in a very moist or wet corner of the garden; but the best produce is secured where running water is available, and it is for this reason that many acres are under Cress cultivation along the banks of the slow moving River Wandle in Surrey. Every bit of

plant will grow, consequently propagation offers no difficulties. Broad, shallow trenches are made, and in these the pieces are dibbled about 4" apart each way; a dressing of decayed cow manure or river mud is then given, and in a few days the water is allowed to rise 2" or 3". These beds are replanted annually, and they provide a crop each month.

with doing damage to the very young growths of plants. Crickets may be trapped with a mixture of treacle, flour, and beer, in the form of a syrup, adding a very few drops of oil of aniseed. A small amount is placed in a clean vessel, the outer sides of which are covered with cloth to assist the crickets to enter the jar. The so-called singing is



Photo: Cassell & Company, Ltd.

CRINUM GIGANTEUM (see p. 250).

After each cutting a top-dressing is given, and the Cresses are beaten down with a flat board. Cresses grown on moist borders are always coarser and of more pungent flavour than those grown in running water.

CRICKETS.

The domestic cricket (*Gryllus domesticus*) is found in the hot, dry air of stoveholes, and frequently passes to the houses, where it is credited

produced by the friction of the basal portions of the wing cases against each other.

CRINUM.

Description.—This large genus of bulbous plants (*ord.* Amaryllidaceæ) includes stove, greenhouse, and hardy species, some few of which ought to find places in all gardens. Apart from the acknowledged beauty of the flowers, the leaves are decidedly handsome.

Propagation.—By seeds or offsets. Generally speaking, the latter system is the better, for if large offsets are secured and potted in the early spring they will grow and produce excellent flowers in about fifteen months. Propagation from seeds is easy, but it takes about four years to grow flowering plants. The pots, which should contain one seed each, ought to be placed in a propagating case. The seedlings must be repotted before they become root-bound.

Soil.—A mixture of mellow, fibrous loam two parts, fibrous peat one part, both being pulled to pieces and used in a lumpy state, with sharp sand to ensure porosity, suits.

Other Cultural Points.—When the species that are grown in large pots or tubs have reached the utmost convenient size, annual repotting or retubbing is neither necessary nor desirable, provided perfect drainage was given at the outset. Let top-dressing take the place of potting, displacing some of the surface soil by fresh, rich compost. Bulbs of the hardy species should be covered by 8" of soil, which must be rich, without containing a great deal of fresh manure, and moisture-holding, but not to the point of stagnation.

Principal Species :—

amabile, 3' to 4', Je., Jy., st., red pur. (*syn.* *superbum*).
asiaticum, 3', Jy., st., wh.
Kirkii, 2', aut., wh., red (*syn.* *massaianum*).
longifolium, 3', Jy., hdy., pk. Flourishes on the margins of ponds. There is a fine wh. form (*syn.* *capense* and *riparium*).
Macowani, 3', Nov., Dec., cool st., wh. pur.
Moorei, 2', spr. or aut.,

Other Species :—

americanum, 2', Je., wh.
angustifolium, 2', Jy., wh. (*syn.* *arenarium* and *australasicum*).
aquaticum (*see* *campanulatum*).
arenarium (*see* *angustifolium*).
augustum, 1½', Jy., ro.
australasicum (*see* *angustifolium*).
australe (*see* *pedunculatum*).
brachynema, 1½', Je., wh.
bracteatum, 1', Je., wh.
Broussonetii (*see* *yucciflorum*).
campanulatum, 4', sum., ro. (*syn.* *aquaticum*).
canaliculatum (*see* *pedunculatum*).
capense (*see* *longifolium*).
careyanum, 2', Oct., bluish.
Colensoi (*see* *Moorei*).
Commelynii, 2', Jy., wh. (*syn.* *lindleyanum* and *revolutum*).
cruentum, 4', Jy., pk.
defixum, 2', Oct., wh.
distichum, 2', Jy., pur., wh.
erubescens, 2', Jy., wh., pur.

cool st., ro. One of the best known. There is a beautiful wh. var. (*album*), and also one with variegated leaves (*variegatum*) (*syn.* *Colensoi*, *Mackenii*, *makoyanum*, and *natalense*).
Powellii, 4', Jy., sub-hdy., ro.; a hybrid from *longifolium* and *Moorei*. There are wh. (*album*) and red (*rubrum*) forms (*syn.* *grandiflorum*).

flaccidum, 2½', Jy., wh.
forbesianum, 1½', Oct., wh. red.
giganteum, 4', Jy., wh. (*see* p. 249) (*syn.* *nobile* and *vanillodorum*).
grandiflorum (*see* *Powellii*).
Hildebrandtii, 2', Aug., wh.
latifolium, 2', Jy., pk. (*syn.* *moluccana* and *speciosum*).
leucophyllum, 2', Aug., pk.
lindleyanum (*see* *Commelynii*).
lineare, 2', sum., red, wh.
Mackenii (*see* *Moorei*).
makoyanum (*see* *Moorei*).
massaianum (*see* *Kirkii*).
moluccanum (*see* *latifolium*).
natalense (*see* *Moorei*).
nobile (*see* *giganteum*).
pedunculatum, 4', sum., grn. wh. (*syn.* *australe*, *canaliculatum*, and *taitense*).
podophyllum, 1', Oct., wh.
revolutum (*see* *Commelynii*).
riparium (*see* *longifolium*).
seabrum, 3', My., pk.
Schimperii, wh.

Schmidtii (*see* *Moorei* *album*).
speciosum (*see* *latifolium*).
submersum, 1½', Jy., pk.
superbum (*see* *amabile*).
taitense (*see* *pedunculatum*).
vanillodorum (*see* *giganteum*).
yucciflorum, 1½', sum., red, wh. (*syn.* *Broussonetii*).
yemensense (*see* *latifolium*).
zeylanicum, 3', Je., pur.

CRISTARIA.

A little-grown genus of about twenty species of plants (*ord.* *Malvaceæ*), generally of prostrate habit, and requiring greenhouse or stove treatment. They like a peaty soil, and are propagated by cuttings, or by seeds sown in heat in spring. Practically the only one in cultivation under the name of *Cristaria* is the undernoted, which properly belongs to the *Malvastrums*, and is a pretty herbaceous plant, hardy in this country.

Principal Species :—

coccinea, 6", Aug., sc. (now *Malvastrum coccineum*).

CRITHMUM. (SAMPHIRE.)

A hardy perennial plant (*ord.* *Umbelliferae*), the only species now included in the genus being a fleshy-leaved subject frequently used for making pickles. It is a seaside plant, but may be cultivated successfully inland if planted, or the seeds sown, on a shaded, sheltered border in a warm position. Some recommend that the plants should be watered occasionally with a weak solution of Tidman's or other sea-salt. Other plants formerly known as *Crithmum* will be found under *Astydamia*, *Cenolophium*, *Deveria*, *Seseli*, etc. *C. latifolium* is *Astydamia canariensis*.

Only Species :—

maritimum, 1', Aug., wh.

CROCKS.

The pieces of broken flower pots which are used to form drainage for pot plants. One large, roughly rounded piece is placed concave side downwards, to cover the hole at the bottom of the pot. Over this smaller pieces are arranged in layers in large pots, or loosely scattered in to a depth of ¾" or so for smaller ones; the whole being carefully covered with semi-decayed leaves, peat fibre, or moss, on which the soil rests, and whose intrusion into and choking of the drainage is thereby prevented. Small lumps of coke, cinders, or gravel sweepings may take the place of ordinary crocks.

CROCOSHIA.

A very handsome bulbous plant (*ord.* *Iridæ*), which is one of the parents of the favourite *Montbretia* (now *Tritonia*) *crocoshiaeflora*, and is very ornamental in borders, or grown in pots for the greenhouse or conservatory. It is rather tender in cold districts and on some soils, and it is wise to cover the surface of the soil before frost sets in with 3" or 4" of Coconut fibre refuse or dry litter. Or the corms may be lifted when the leaves become yellow, and stored in a dry place, free from frost, until spring. Plant from 4" to 6" deep in rich but light soil. This fine plant is propagated by offsets, removed when the plant is at rest, or by seeds sown in pots under glass or in a frame as soon as ripe.

Only Species :—

aurea, 2', Jy., etc., or. Vars. of much worth are *imperialis* and *maculata*, the former being very fine.

Crioceris (*see* *Asparagus Beetle*).

CROCUS.

Description.—Charming spring-, autumn-, or winter-flowering bulbous plants (*ord. Iridæ*), so well known as to need no detailed description. They are of the highest decorative value, either for planting in beds or borders, on grass, in the rock garden, or in frames. They are also very pleasing when grown in pots for the house or conservatory. All are hardy, except when otherwise indicated. The various species, as distinguished from the popular Dutch spring Crocuses, are very desirable, and ought to be more largely grown. Those which bloom in autumn are especially worthy of the notice of garden lovers. *Sativus* produces the saffron, for which it was at one time largely grown in England.

Propagation.—By offsets or by seeds, the former being removed when the plants are at rest, and the latter sown as soon as ripe, or in spring, in pans or in the open ground, where, if not sown too closely, the seedlings may remain until large enough to flower. When rapid increase is desired, the corms or "bulbs" (the former being the proper term) may be planted about 4" apart, and lifted every two or three years.

Soil.—The Crocus will grow in almost any good soil, but it thrives best when it has one of a rich, light, sandy nature.

Other Cultural Points.—Crocuses ought to be as short a time out of the ground as possible, so that replanting should, if possible, be done immediately after lifting. The best time to do this is as soon as the leaves have become quite yellow, and come freely away from the corms. Plant about 3" deep, and the same apart, unless an immediate effect is required, when they may be placed almost close together. When Crocuses are to be planted in grass, it is desirable to remove the turf immediately above where they are to be planted, and to stir the soil below thoroughly, adding, if it is poor, a little bone dust or basic slag, and replacing the turf after the Crocuses are in position. Plants in grass or elsewhere must not have the leaves cut off before they have become yellow. Forgetfulness of this is responsible for the poor results often seen.

Crocuses in Pots.—These should be planted close together; from five to six corms are required for a 5" pot. They may be only lightly covered with soil, and then plunged in ashes or Cocoanut fibre refuse in the open or in a cold frame until the roots have nearly filled the pots and top growth has begun, when they may be taken indoors and gradually brought on in a higher temperature. The Dutch Crocuses may be grown in water, like the Hyacinth, or in damp moss or Jadoo.

Key to the Genus.—An admirable key to the genus was drawn up by Mr. George Maw, whose great "Monograph of the genus Crocus" is a standard work on the Crocuses, and of great assistance to growers.

Principal Species and Varieties:

aureus, spr., or. yel. The parent of our golden yel. Dutch Crocus, so indispensable in our gardens in spr. There are a number of vars. of this species, of which a few of the best are *albus*, *flavus*, *lacteus*, *lacteus pencillatus*, *lutescens*, *miesiacus*, *pallidus*, *sulphureus*, and *trilineatus*. These vary in shade of yel. or creamy wh.

biflorus, spr., wh. A useful, very early Crocus, giving a number of forms, such as *Adami*, *Alex-*

andri (*syn. C. Alexandri*), *argenteus*, *cærulescens*, *estriatus*, *Leichtlinii*, *nubigenus*, *Pestalozzæi*, *purpurascens*, *pusillus*, and *Weldenii*.

chrysanthus, spr., or. Several vars., including *albidus*, *cærulescens*, *Canary Bird*, *fusco-lineatus*, *fusco-tinctus*, and *superbus*.

Imperati, spr., pur., buff exterior. A very early and desirable species. There are several forms, those known as *longiflorus* and *albus* being desirable.

longiflorus, aut., lil., pur. A pretty, sweet scented species (*syn. odoratus*), vars. *Wilhelmi* and *melitensis*.

nudiflorus, aut., pur. A good aut. Crocus, said to be wild or naturalised near Nottingham.

sativus, aut., pur. The Saffron Crocus, from which is obtained the genuine saffron of commerce. There are a number of forms, nearly all



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CROTON REIDII (see p. 254).

of which bloom more freely than the type, which is shy in many gardens. Good forms are *cartwrightianus*, *Elwesii*, *Haussknechtii*, *Pallasii*, and *Taitii*. These range from wh. to pur.

Sieberi, spr., lil. A lovely little species, one of the earliest to bloom. It is variable, and the form *versicolor* is very beautiful.

speciosus, aut., lil., pur. Among the most effective of all the aut. species, and one of the first to bloom. The form or var. *Aitchisonii* is very fine.

tommasinianus, spr., lavender. A cheap little early blooming Crocus, which should be planted in quantity. It varies slightly in shade of colour.

vernus, spr., wh. to pur. A valuable species, the parent of the finely coloured Dutch wh., pur., and striped Crocuses, whose names will be found in any catalogue. There are a good many less well known forms worth growing, such as *concinus*, *George Maw*, *Leedsii*, *leucorhynchus*, *obovatus*, *siculus*, etc.

versicolor, spr., pur., striped. A variable Crocus, known as the Cloth of Silver Crocus. Vars. *albus*, *picturatus*, *reflexus*, and *violaceus*.

zonatus, aut., ro. lil. One of the most beautiful of all, and desirable for every garden.

Other Species and Varieties :—

ærius, spr., bl.
 alatavicus, spr., wh., pur.;
 vars. lilacinus, pallidus,
 purpureus, etc.
 ancyrensis, spr., or.
 asturicus, aut., pur.
 atticus, spr., wh.
 Balansæ, spr., or., br.
 banaticus, spr., pur.
 Biliottii, spr., pur.
 Boisseri, spr., wh.
 Boryi, aut., wh.
 — marathoniæus.
 Cambessedesii, aut., lil.,
 pur.
 cancellatus, aut., pur.;
 vars. cilicicus, maz-
 ziarius, lilacinus, etc.
 candidus, spr., wh. (*syn.*
 Kirkii).
 — luteus.
 carpetanus, spr., lil.
 caspius, aut., wh.
 Clusii, aut., pur.
 corsicus, spr., lil., buff.
 cyprius, spr., lil.; tender.
 Crewei, spr., wh., anthers
 chocolate.
 dalmaticus, spr., lil., pur.
 Danfordiæ, spr., pale yel.
 etruscus, spr., lil., wh.
 — pallidus.
 Fleischeri, spr., wh.,
 feathered pur.
 Gaillardotii, spr., lil.
 gargareus, spr., yel.
 granatensis, aut., pur.,
 wh.
 hadriaticus, aut., wh.
 — chrysobeloncus.
 hermonæus, aut., pur.,
 wh., tender.
 hyemalis, win., wh.
 — Foxii, chocolate an-
 thers.
 iridiflorus, aut., pur.; var.
 major fine (*syn.* by-
 zantinus).
 karduchorum, aut., lil.
 Korolkowii, win., or., br.
 lævigatus, aut., wh., lil.,
 pur. (*syn.* Boryi lævi-
 gatus).
 lazicus, spr., or.
 Malyi, spr., wh.
 mazziarius, aut., wh.
 medius, aut., pur., var.
 pallidus.
 minimus, spr., buff, vio.
 montenegrinus, spr.,
 cream.
 nevadensis, spr., pur. (*syn.*
 atlanticus).
 ochroleucus, aut., wh.,
 yel.; slightly tender.
 Olivieri, spr., or.
 parviflorus, spr., lil.
 pulchellus, aut., bl.
 reticulatus, spr., wh., lil.
 — albicans, wh.
 Salzmännii, aut., pur.
 — erectophyllus.
 Scharojanii, aut., or.;
 tender.
 serotinus, aut., pur., lil.
 stellaris, spr., or., striped
 pur.
 suaveolens, spr., pur.,
 buff.
 sulphureus, spr., yel.;
 vars. pallidus, striatus,
 etc.
 susianus, spr., or.,
 feathered br.
 suterianus, early spr., or.
 Tauri, spr., pur.
 Tournefortii, aut., lil.,
 feathered pur. (*syn.*
 Orphanidis).
 vallicola, aut., pale wh.;
 vars. lilacinus and su-
 warrovianus; tender.
 veluchensis, spr., pur.
 Veneris, aut., wh., lil.;
 tender.
 vitellinus, win., or.

CROPPING.

The term applied to the planting and cultivation of land: Double cropping consists of growing two distinct kinds of plants together on the same ground, of which Strawberries alternating in rows with Onions, or Spinach with Peas, are examples.

CROSSES (see ARTICHOKES, CHINESE).

CROSSANDRA.

Handsome stove evergreen shrubs (*ord.* Acanthaceæ) that flourish in rich loam, peat, and sand, and may be propagated by cuttings inserted in sand beneath a bell-glass over bottom heat.

Principal Species :—

flava, 1', Feb., yel.
 undulæfolia, 1½', Mch.,
 or. sc. (*syns.* axillaris
 and infundibuliformis).

Other Species :—

axillaris (see undulæfolia).
 guineensis, 6'', Oct., pale
 lil.
 infundibuliformis (see un-
 dulæfolia).
 peduncularis, 1½', Mch.,
 or. sc.; probably a var.
 of undulæfolia.

CROTALARIA.

This genus comprises a large number (about 200) of greenhouse and stove annuals and evergreens (*ord.* Leguminosæ), but they cannot be regarded as very popular. The annuals are readily raised from seeds, and the evergreens from cuttings, a fairly high temperature being requisite in both cases. A mixture of fibrous loam and peat, with coarse sand, is suitable. These plants are very prone to the attacks of red spider.

Principal Species :—

Cunninghamii, 3', Feb.,
 st. ev., pur., yel., grn.
 juncea, 1' to 2', Jy.,
 golden yel.
 longirostrata, 3', Aug.,
 yel.

Other Species :—

incana, Je., Jy., yel.
 laburnifolia, Jy., Sep.,
 yel.
 pumila, Jy., Aug., yel.
 semperflorens, Mch., Sep.,
 yel.

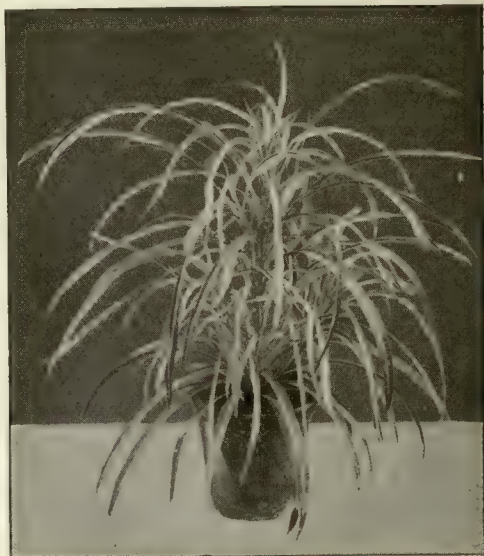


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CROTON ALGBURTHIENSIS (see p. 254).

CROTON. (CODIÆUM.)

Description.—The plants now being dealt with under the popular name of Croton are classed by botanists under Codæum. They are, however, so universally known in gardens as Crotons that the name is retained to avoid confusion in the minds of non-botanical readers. Both genera belong to the same Natural Order (Euphorbiaceæ), but whereas the true Crotons have comparatively little to recommend them from a horticultural point of view, the Codæums are amongst the most useful, beautiful, and graceful foliage plants that we have. Garden raised hybrids and varieties are innumerable, and they present a greater range of beauty in foliage than any other evergreen shrub that is grown in our stoves.

Propagation.—Plants can be raised from seeds, but this process commends itself only to those who

Crossyne (see Buphane).



Photo: Cassell & Company, Ltd.

CROTON MRS. SWAN.



Photo: Cassell & Company, Ltd.

CROTON PRINCESS OF WALES.



Photo: Cassell & Company, Ltd.

CROTON SUNSHINE.



Photo: Cassell & Company, Ltd.

CROTON COUNTESS.

are seeking for new varieties. The general practice is to raise stock by the aid of cuttings of the firm upper portions of the shoots, which root readily in sandy peat, beneath a bell-glass, over bottom heat, and shaded from the sun. Cuttings can also be rooted in water, and in either case they must be potted as necessary.



Photo : Cassell & Company, Ltd.

CROTON HAWKERI.

Soil.—The best compost for these plants consists of fibrous loam three parts, peat and leaf mould one part each, with sharp sand according to the nature of the principal ingredients. Instead of adding manure to the compost, it is preferable to feed with liquid manure when the pots containing the plants are full of roots.

Other Cultural Points.—When plants become "leggy," and lose their lower leaves, as they are somewhat prone to do, elegant specimens, beautifully "feathered," and admirable for table decoration, may be had by rooting the tops. An upward cut about 1" long is made beneath the lowest leaves, and a small piece of wood is inserted to keep the cut portion from the parent stem. Moss is then bound round, and if kept moist in a high temperature, roots will be emitted, and the whole may be severed from the parent stem and potted in the customary manner. Plants grown on a single stem are most useful, but branched plants may be secured by pinching out the lead in the early stages and once subsequently stopping the side growths. The plants must be kept scrupulously clean, and must have the benefit of the fullest light if the finest colouring is expected.

A Selection of Varieties :—

nigburthiensis, narrow,	Flambeau.
bright red, grn. (see	Golden Ring, twisted lvs.,
p. 252).	rich yel.; blotched grn.
angustifolium, narrow,	Hawkeri, creamy wh.,
golden yel., yel., grn.	grn. (see figure).
Bismarckii, grn., yel.	Her. Majesty, narrow
veins and blotches.	foliage, golden yel.,
Chelonii, or., salmon red,	deep grn.
crim.	illustris, grn., spotted yel.
Disraeli, grn., veined yel.	interruptum aureum, pur.
Earl of Derby, golden	grn., golden yel.
yel., margined grn.	Johannis, grn., margined
evansianum, grn., yel.,	yel.
crim., sc.	Laingii, grn., red, salmon.

Mdme. E. Bergmann, old	Reidii, broad, yel., pur.
gold, red br.	grn., salmon, bronze
Mdme. E. Tournier, broad	(see p. 251).
lvs., gold; olive grn.	Russellii, sc., red, br.
majesticum, grn., yel.,	Shuttleworthii, grn., yel.,
crim.	br.
Mayi, narrow foliage, grn.,	Thomsonii, broad lvs.,
yel.	gold, chocolate, crim.
Mrs. Clibran, narrow	variegatum tricolor, grn.,
grn., golden yel.	gold, cream.
Mrs. Lewis, narrow, pale	Venus, narrow, twisted
grn., yel.	lvs., light yel., deep
Newmannii, grn., red, yel.	grn.
picturatum, dark grn.,	Warrenii, very handsome,
yel., red.	twisted lvs., grn.,
Princess of Wales, gold,	or., car. (see figure).
cream, grn. (see p. 253).	Williamsii, broad, grn.,
Princess Waldeck, gold,	crim., magenta.
grn.	Weismannii, grn., veined
Queen Victoria, broad lvs.,	and margined yel.
gold, magenta, crim.	Van Oosterzei, small
recurvifolium, grn., cream,	lvs., grn., spotted
yel.	pale yel.

True Crotons.—The true Crotons are stove evergreens. The principal species are Eleuteria; 5', June, greenish white, which gives the Eleuteria bark of commerce; and Tigilium, 10', August, greenish white, from whose seeds is expressed the powerful purgative known as Croton Oil.

CROWBERRY.

The Crowberry, *Empetrum nigrum*, grows in the highlands of Scotland, and the purple berries are sometimes eaten, but if taken in quantity are said to produce headache. They are employed in Siberia in making a refreshing drink, and in other parts of northern Asia for making a dark purple dye.

CROWEA.

These Australian evergreen shrubs (*ord. Rutaceae*) grow well in the greenhouse, and may be



Photo : Cassell & Company, Ltd.

CROTON WARRENI.

increased from cuttings in very sandy soil. Soil, peat and loam. They require careful watering at all stages.

Principal Species :—

saligna, 2' to 3', Aug.,	latifolia (see saligna).
pk., pur. (<i>syn. latifolia</i>).	

Other Species :—

elliptica, 3', Jy., pk.

CROWN IMPERIAL. (FRITILLARIA IMPERIALIS.)

The effective garden bulbous plants (*ord.* Liliacæ) known as Crown Imperials are varieties of *Fritillaria Imperialis*, and are of considerable value by reason of their bold habit and distinct appearance. They thrive in good, rich soil, and should have a position which is not exposed to cold winds when they are in bloom. Their large heads of drooping flowers, surmounted by a tuft of leaves, are very ornamental. Plant as early in autumn as possible. The variegated-leaved forms are desirable.

A Selection :—

Crown upon Crown, two tiers of yel. flowers.	gatis, silver variegated.
lutea, yel.	— foliis aureis variegatis, gold variegated.
— pleno, double flowers.	Slagzwaard, fasciated stem.
Orange Brilliant, or.	— foliis argenteis variegatis, silver sulphureous, sulphur.
rubra maxima, red.	
— foliis argenteis varie-	

CRUCIANELLA.

A genus of upwards of twenty perennial or annual plants (*ord.* Rubiaceæ), with leaves in whorls and rather tubular-shaped flowers. They are increased by seeds sown in spring in a frame or greenhouse, or by division at the same season; and grow in common soil. The plant most generally cultivated under this name is *stylosa*, a pretty hardy perennial. All are perennials, and hardy unless otherwise mentioned.

Principal Species :—

americana, 1', Jy., grh.	molluginoides, 1', Jy., yel.
per., yel.	(now <i>Asperula molluginoides</i>).
chlorotachys, Jy., hlf-hdy., yel.	pubescens, 1', Jy., hlf-hdy. (now <i>Asperula incana</i>).
glauca, Jy., hlf-hdy., yel. (<i>syn.</i> glauca).	stylota (now <i>Asperula ciliata</i>).
glomerata, 1', Jy., yel. (now <i>Asperula glomerata</i>).	suaveolens, 1', Jy., yel.
maritima, 1', Jy., grh. ev., yel.	

CRYPTANTHUS.

These curious plants (*ord.* Bromeliacæ) are natives of Brazil, and are closely related to the Billbergias. They are stove epiphytes, and succeed with the Caraguatas and Bromelias. (*See* BROMELIA.)

Principal Species :—

Bucheri, 6", Aug., wh., red.	undulatus, 10", wh., pur. grm. leaves.
bivittatus, 10", Aug., wh. (<i>syn.</i> Moensii).	— ruber, 10", red., pur. foliage.

CRYPTOCHILUS.

A small Himalayan genus (*ord.* Orchidacæ), founded by Wallich. They grow well with the Erias, being nearly related to them and to *Trichosma*.

Principal Species :—

sanguinea, 6", sum., bright sc.

CRYPTOCORYNE.

A small genus (*ord.* Aroidæ) of stove herbaceous

Crowfoot (*see* Ranunculus).

Cruikshanksia of Hooker (*see* Balhisia).

Cryptophragmium (*see* Gymnostachyum).

perennials, increased by division. They do best in a compost of peat and loam.

Principal Species :—

ciliata, 1', My., pur. grm. spiralis, 1', My., br. cordata, 1', Je., grm.

CRYPTOGAM.

The vegetable kingdom is divided into two great sections—the flowering (*Phanerogams*) and flowerless plants. The latter are known as *Cryptogams*, because in earlier times their methods of fertilisation and fructification were not understood, but supposed to be concealed. The word is derived from the Greek *kryptos* (hidden) and *gamos* (marriage).

CRYPTOGRAMME.

The beautiful little Parsley Fern constitutes the chief member of this genus (*ord.* Filices). It is widely spread over the north Temperate Zone, and is found in the north of England and Wales, though not plentifully. Well-drained compost and a Wardian case will ensure the full development of this species.

Principal Species :—

crispa, 6", grm.

CRYPTOMERIA. (JAPAN CEDAR.)

A stately and interesting tree (*ord.* Coniferae), largely grown in Japan, and doing well in Great Britain under favourable conditions of soil and climate. A good specimen is very ornamental, with its lustrous green leaves and cinnamon brown bark. Propagation is by seeds sown in a frame or greenhouse, or by cuttings under a handlight or a frame. According to the "Manual of the Coniferae," the *Cryptomerias* require a deep, well-drained soil, with abundance of moisture of which the supply is not intermittent, and protection from cutting winds. The same authority recommends that a radius of at least 25' should be allowed to each specimen.

Only Species and Principal Varieties :—

japonica, 60' to 125'.	— nana, 3', a curious dwarf form.
— araucarioides, 7', branches deflexed.	— sinensis, diffused habit, deflexed branchlets, longer growths and lvs.
— elegans, a very ornamental form with bronzy grm. foliage in winter (<i>syn.</i> Veitchii).	— spiralis, a singular form with the lvs. closely appressed to the branchlets.
— Lobbii, more spire-like and of compact habit, lvs. darker.	

CRYPTOPHORANTHUS.

Although of no special beauty, this genus (*ord.* Orchidacæ) commends itself to lovers of botanical, as distinguished from horticultural, plants. The species succeed with the cool *Odontoglossums* and *Masdevallias*. They are now referred by some botanists to *Pleurothallis*.

Principal Species :—

atropurpureus, 4", pur.	pur., yel. (<i>syn.</i> Masdevallia dayana).
dayanus, 3", Oct., red.	maculatus, 2", Aug., yel.

CRYPTOSTEGIA.

These stove evergreen climbers (*ord.* Asclepiadæ) succeed well in a mixture of loam and peat, and may be propagated from cuttings in sand beneath a bell-glass over bottom heat.

Principal Species :—

grandiflora, 6', Je., pk.	madagascarensis, 10', Jy., pk.
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CRYPTOSTEMMA.

These tender annuals (*ord.* Compositæ) succeed best when grown from seeds sown in boxes over gentle bottom heat; thin and pot as may be necessary, and place in the open border in any fertile soil about the first week in June.

Principal Species:—

calendulaceum, 1', Jy.,	are yel. flowered, hypo-
yel. (<i>syn.</i> Arctotis cal-	chondriacum and run-
endulacea). There are	cinatum.
two vars., both of which	forbesianum, Jy., yel.

CRYPTOSTYLIS.

These little East Indian plants (*ord.* Orchidaceæ) have tuberous roots, and can be grown in a warm house. *Zosterostylis* is a title under which some of the species were at one time known.

Principal Species:—

Arachnites, 1', gm., yel.,	longifolia, 2', yel., gm.,
pur.	red br.

CUBA BAST.

This material was more popular a few years back than is the case at present. It is the inner bark of *Hibiscus elatus*, and is remarkably strong and coarse, and for that reason is in some instances superior to raphia (raffia), which is so extensively employed for general tying.

CUCKOO SPIT.

Everyone who has a garden knows the frothy envelope containing a tiny, pale green, aphid-like insect, which can hop smartly. This pest is found on Carnations, Hawthorn, and Roses, and its name is *Tettigonia spumaria*. The perfect insect emerges in July. Sharp syringing or dipping in tobacco water are remedies.

CUCUBALUS.

Hardy herbaceous plants (*ord.* Caryophyllææ), with opposite leaves and white flowers after the manner of Silene. The only cultivated species is a European plant, and is naturalised in the Isle of Dogs. Propagated from seeds or by division. Will grow in any kind of soil.

Principal Species:—

baccifer, 2' to 3', My., Je., wh.

CUCUMBER.

Cucumis sativus, the Cucumber, is a half-hardy trailing annual (*ord.* Cucurbitaceæ), the fruits of which are prized for salad and pickling purposes. There are numerous varieties suitable for growing in heated houses, frames, and beds outdoors.

Propagation.—From seeds and cuttings, the former being the best. For spring and early summer fruiting, sow seeds singly in small pots in January or February, and plunge the pots over a gentle hotbed. When growth appears, place the plants near the glass in a moist temperature ranging from 65° to 75°. For frame and outdoor culture sow in March and April over gentle bottom heat. Ridge Cucumbers may also be sown outdoors, where they are intended to grow, in May. Sow at the end of September to raise plants for winter fruiting under glass.

Soil.—For seedlings and young plants, equal parts of turfy loam and leaf mould, with a little

sand. For permanent beds use three parts of loam and one part of leaf mould or spent manure from an old Mushroom bed. Add a little road scrapings and old mortar rubble to keep the compost open.

Summer Culture in Houses.—Low span-roofed houses are the best for Cucumbers, with sufficient hot-water pipes to provide top and bottom heat. Slates, with a covering of leaves, should be placed above the pipes under the bed, and then the compost in the form of a ridge. Put out strong plants that have been grown in 5" pots, and train the shoots on wires fastened about 1' from the glass. Maintain a temperature of 66° to 70° by night, and 70° to 80° by day, with a moist atmosphere, and not much ventilation. Avoid overcrowding by thinning out superfluous shoots and leaves. The plants must never suffer from want of water, and when in full bearing should have liquid manure and sprinklings of a good artificial fertiliser. Watch closely for fleshy roots appearing through the soil, and when seen top-dress with loamy soil and decayed manure. Damping the walls and paths several times a day with water and liquid manure is beneficial to the plants, and keeps red spider at bay. Cut the fruits as soon as they are large enough for use.

Winter Culture in Houses.—Except in cases where a supply is required all the year round, Cucumbers are not much grown for fruiting in the winter, and this phase of culture is attended with difficulties. A low, light house, in which abundance of top and bottom heat can be obtained, is necessary. The soil should be of a lighter nature than that for summer-cropping plants, and healthy specimens should be put out at the end of October. Maintain a warm, moist temperature of from 65° to 75°, but little or no syringing is required through the winter. Avoid overcropping, and thin the growths to admit all the light possible.

Frame Culture.—Cucumbers may be successfully grown in the summer in frames heated by hot water or fermenting material. In the case of the latter, a hotbed must be formed of stable litter and decayed leaves. When the heat is declining a little, place mounds of soil in the frame, and put out one plant under each light. Keep the interior of the frame moist by syringing with tepid water, avoid overcrowding by thinning the shoots, and feed with liquid manure. In warm weather ventilate early in the day, shade from hot sunshine, and syringe and shut up the frame early in the afternoon.

Outdoor Culture.—The ridge varieties are the best for outdoors. Select an open, sunny position where the soil is deep and rich. Plants raised under glass should be put out at the end of May, about 3' apart. When seeds are sown outdoors, thin the young plants to the above distance. Give liquid manure when in full bearing, and cut the fruits before they become large and seedy.

Enemies.—*Aphis*.—For remedies, see APHIDES.

Mildew.—Insufficient heat and draughts of cold air are responsible for the presence of this fungus. Remove badly affected leaves, and dust with flowers of sulphur.

Red Spider.—This is the bane of Cucumbers, and is often traced to faulty cultivation. The company of other spider-infested plants, want of water, and a too dry atmosphere are prime causes. Remove badly infested leaves, syringe with a good

Cucifera (see *Hyphæne*).

Cuckoo Flower (see *Cardamine*).

Cuckoo Pint (see *Arum maculatum*).

Cucumber tree (see *Magnolia and Averrhoa*).

insecticide, and maintain favourable conditions for the making of fresh growth.

Root Disease.—The root knob eelworm (*Heterodera radiculicola*) is the most destructive of Cucumber foes. Its presence is indicated by the plants flagging in bright weather, and the fruits refusing to swell. Examination of the roots reveals a number of distorted knobs, which contain the minute eelworms. The trouble may be introduced by infected water, soil, or manure, and care should be taken that soil from an infected bed is not used again for the same crop. There is no remedy, and affected plants should be removed and burnt, the soil afterwards taken out, and

female flowers, and large, succulent fruits. The Cucumber and Melon are well-known examples. The majority require to be grown in a moist stove, but a few can be grown out of doors in summer. (*See GOURDS.*)

Propagation.—Seeds should be sown in spring in moist, sandy soil, in heat, and little or no water must be given until germination takes place, which is usually within five days of the time of sowing.

Soil.—Good, fibrous loam, with an addition of leaf mould, rotten manure, and some coarse sand, suits.

Other Cultural Points.—When grown for orna-



A HOUSE OF TELEGRAPH CUCUMBER WELL GROWN.

the bottom and sides of the bed dressed with hot lime.

Thrips.—These pests sometimes attack the foliage, and should be immediately checked by fumigating with a good vaporising insecticide.

A Selection of Varieties :—

Cardiff Castle.	Rochford's Market.
Lookie's Perfection.	Sensation.
Matchless.	Telegraph Improved.

Open Air or Ridge Varieties :—

Gherkin (for pickling).	Long Prickly.
King of the Ridge.	Stockwood Long Ridge.

CUCUMIS.

Description.—Herbaceous climbing or prostrate plants (*ord.* Cucurbitaceæ), widely distributed in the Tropics. They are usually annuals, with succulent stems, climbing by means of tendrils, have large, deeply lobed rough leaves, yellow male and

female flowers, and large, succulent fruits. The Cucumber and Melon are well-known examples. The majority require to be grown in a moist stove, but a few can be grown out of doors in summer. (*See GOURDS.*)

Propagation.—Seeds should be sown in spring in moist, sandy soil, in heat, and little or no water must be given until germination takes place, which is usually within five days of the time of sowing.

Soil.—Good, fibrous loam, with an addition of leaf mould, rotten manure, and some coarse sand, suits.

Other Cultural Points.—When grown for orna-

ment, the young plants should, when 6" high, be planted on a little mound of well-drained soil against wires running up the rafters or pillars of a stove or warm intermediate house. Two or three shoots should be allowed to grow unchecked until they have attained the desired height. The points must then be pinched out and side shoots encouraged. From the side shoots flowers will appear. These it is often advisable to pollinise by hand. When a sufficient number of fruits are set, superfluous shoots must be cut out. (For special culture of Cucumber and Melon, *see* under those heads.)

Principal Species :—

Melo, 4' to 6', sum., yel.	— sikkimensis, 6' to 8',
(<i>see</i> Melon).	sum., yel., fruit br.,
— Dudaim (Queen Anne's	netted wh. (Himalayan
Melon).	Cucumber).
sativus, 6' to 8', sum., yel.	
(<i>see</i> Cucumber).	

Other Species :—

Anguria, 3', sum., yel.
 Citrullus (*see* Citrullus
 vulgaris).
 metuliferus, 6', sum., yel.
 (Horned Cucumber).

moschatus (*see* Cucurbita
 moschata).
 Prophetarum, 6', sum., yel.
 trigonus, 5', sum., yel.
 utilisimus, a var. of
 Melo.

CUCURBITA.

A genus of half-hardy annuals (*ord.* Cucurbitaceæ), allied to Cucumis and distributed throughout the Tropics. In general appearance they resemble the Cucumber family, but are stronger growing, and have different shaped fruit. The best known species provide the Pumpkin and Vegetable Marrow and the ornamental Gourds. Although the majority grow well out of doors in summer, a few require to be grown indoors. Seeds should be sown in spring in a similar manner to that recommended for Cucumis. Any rich, loamy garden soil is suitable, a stiff loam for preference. The young plants should be grown indoors until June, at which time they should be from 1½' to 2' high. They should then be planted out.

Principal Species :—

maxima, 8', sum., yel.,
 fruit yel., red, grn.
 (ornamental Gourd).
 There are many garden
 forms.

Pepo, 15', sum., yel., fruit
 yel. (Pumpkin).
 — ovifera, 18', sum., yel.
 (Vegetable Marrow).
 (For garden forms, *see*
 Vegetable Marrow.)

Other Species :—

ficifolia, 8', sum., yel. (*syn.*
 melanosperma).
 moschata, 6', sum., yel.
 (Musk Melon).

verrucosa, 12', sum., yel.;
 a var. of Pepo.

CULCASIA.

West African climbers (*ord.* Aroidæ), requiring to be grown in a stove. They make long, thin, wiry branches, climbing by means of roots, and are thinly clothed with simple leaves 8" long. The spathe of the inflorescence is whitish brown and not showy. May be increased by cuttings and grown in a mixture of peat, charcoal, and sand.

Only Cultivated Species :—

scandens, 15', Je., wh. br.

CULLUMIA.

Small shrubs (*ord.* Compositæ) with numerous thin branches covered with small leaves terminated by brown spines. They are South African plants, and require to be grown in a greenhouse. Cuttings of half-ripened wood placed in sandy soil in a propagating case root readily, and a mixture of fibrous peat and loam with a good dash of coarse sand suits.

Principal Species :—

ciliaris, 2', My., Je., yel.

CUMINUM.

Hardy annuals (*ord.* Umbelliferæ) with Fennel-like leaves and large umbels of inconspicuous flowers. They are found on the African shores of the Mediterranean. One species is cultivated for the sake of its aromatic seeds, which are used for culinary purposes. Any ordinary garden soil.

Principal Species :—

Cuminum, 2', Je., wh. (Common Cumin).

CUNILA.

Herbs or sub-shrubs (*ord.* Labiatæ), generally of little horticultural value, with small white or purple flowers, like those of Balm or Mint. That named

Cumingia (*see* Conanthera).

below is the only one which appears to be grown in gardens. It is a hardy perennial, which grows in common soil, and is propagated by seeds sown in spring, or by division at the same season.

Principal Species :—

mariana, 1', Jy., pur.

CUNNINGHAMIA.

(BROAD-LEAVED

CHINA FIR.)

An evergreen tree (*ord.* Coniferæ) closely allied to the Araucarias, but not sufficiently hardy to be grown out of doors, except in favoured localities in the South of England and Ireland. Even there it is much disfigured by storms. It grows to a height of 30' to 35' in this country, and requires a light soil. It should be propagated from seeds.

Only Species :—

sinensis (*syns.* *Belis jaculiflora* and *Pinus lanceolata*).

CUNONIA.

A South African genus (*ord.* Saxifrageæ), one species being in cultivation. It forms a tree with evergreen, pinnate leaves, and large, upright racemes of white flowers. It can be propagated by means of cuttings inserted in sandy peat in a warm propagating case. Sandy peat and loam, in equal proportions, form a suitable compost. An intermediate temperature is required.

Principal Species :—

capensis, 20' to 30', Aug., wh.

CUPANIA.

Trees and shrubs (*ord.* Sapindaceæ) from the tropics, with large, ornamental, pinnate leaves, and panicles of greenish white flowers. The stems and leaf-stalks are often covered with a felt-like mass of brown hairs. The few species cultivated rarely flower, and are usually treated as stove foliage plants. The best leaves are obtained by cutting down in alternate years to within a few eyes of the base, allowing one strong shoot to grow. Increased by cuttings from a cut-back plant in a close case. Fibrous loam and peat suit.

Principal Species :—

elegantissima, 20', leaves 2½'. grandidens, 30', leaves 2' to 3'.

Other Species :—

anacardioides, 30', leaves 1½' to 2'. edulis (*see* *Blighia sapida*).
 Cunninghamii (*see* *Diplo-*
glottis Cunninghamii). filicifolia (*see* *Triptero-*
dendron filicifolium).

CUPHEA.

Pretty, but rather neglected, greenhouse herbs or sub-shrubs (*ord.* Lythariæ), of considerable value for the greenhouse or conservatory. A few have also been used with good effect in summer bedding, the best for this being ignea (*syn.* platycentra). Propagation is by seeds, sown in a brisk heat in January or February, the seedlings being pricked off and grown in rich soil in single pots. Also by cuttings of half-ripe shoots struck in bottom heat in March or April. A rich, but not heavy, soil is the most suitable for the Cupheas. Good plants may be grown in 6" pots if the soil is rich and watering with liquid manure is practised to keep them in vigour when the pots are full of roots.

Principal Species :—

æquipetala, 2', Je., grh., pur. (*syn.* *ocymoides*).
 commersoniana, 1', grh.
 cordata, 1½', Je., grh. ev., sc.



Photo: Cassell & Company, Ltd.

CUPHEA IGNEA (see next page).

cyanea, 2', Jy., grh. ev., yel., red. (*syns.* strigill-
osa and pubiflora).
gracilis, 1', Jy., grh., pur.
hookeriana, 3', Jy., grh. sub-shr., ver., or. (*syn.*
Roetzlii).
igneae, 1', Je., grh. or bedding, sc., wh. (*see p.* 259)
(*syn.* platycentra).
— alba, wh.
jorullensis (*see* micropetala).
lanceolata, 1½', Jy., hlf-hdy. ann., bluish (*syns.*
silenoides and Zimapani).
Llavea, 2', Je., grh. ev., ver. (*syn.* miniata).
Melvilla, 3', My., grh., red, grn.
micropetala, 1', Jy., grh. shr., sc., wh. (*syns.*
eminens and jorullensis).
pinetorum, 1½', Jy., grh. ev., crim. (*syn.* cinnabarina).
procumbens, 1', Je., st. ann., pur.
serpyllifolia, 1½', Aug., red.
strigulosa, 1', Je., grh. shr., yel., red.
verticillata, Je., st. per., vio.

CUPRESSUS. (CYPRESS.)

A genus of interesting and very beautiful trees (*ord.* Coniferae), of the greatest value for the decoration of gardens and pleasure grounds in this country, a considerable number being quite hardy in most districts. There are about fifteen recognised species, together with some forms whose claim to specific rank is doubtful. The genus now includes *Chamaecyparis*. Propagation is by seeds or cuttings, the former being sown in April in a free soil. A rich soil of a loamy nature will suit the Cupressuses. They ought to be planted in a place sheltered from cold, cutting winds and severe storms.

Principal Species and Varieties :—

funnebris, 50' to 60'. Unfortunately not very hardy in these islands, but deserving of a place among the principal species because of its singular and graceful appearance. Suitable for Devonshire, Cornwall, and the south of Ireland (*syn.* pendula, *Abel*).

lawsoniana (the Lawson Cypress). A tall tree, most valued because of its numerous vars. of great worth for lawns or small gardens. Upwards of twenty have been named, but the following selection embraces most of the best forms: albo-spica, albo-variegata, argentea, argenteo-variegata, aureo-variegata, compacta, erecta, e. viridis, ericoides, filifera, gracilis pendula, intertexta, lutea, nana, nana alba, and nana glauca (*syns.* attenuata and *Chamaecyparis lawsoniana*).

macrocarpa (Monterey Cypress). A beautiful and hdy. species, 50' to 80', of which there are two good vars. Crippsii is of plumose habit, and has the tips of the young growths yel. Lutea is of the same habit, but all the young foliage is yel. the first season (*syns.* lambertiana and Hartwegii).

nootkatensis (Nootka Sound Cypress), a widely grown species, differing from lawsoniana by its more conical form and deeper grn. foliage, and, among other distinguishing features, by having the staminate flowers sulphur yel. instead of crim. Principal vars., argenteo-variegata, aureo-variegata, compacta, gracilis, lutea, and pendula vera (*syns.* *Chamaecyparis nutkaensis* and *Thujopsis borealis*).

obtusa (Japanese Cypress), 70'. A fine tree, of

which there are many forms. The type and some of these are largely grown by the Japanese. It, with pisifera, is much used for forming the dwarf, stunted trees now sought after here. It objects to chalk and limestone. The following good vars. are usually known in British gardens as *Retinisporas* (often spelt *Retinosporas*): aurea, compacta, filicoides, f. aurea, lycopodioides, Mariesii, and pendula (*syns.* *Chamaecyparis obtusa*, *Retinispora obtusa*, and *Thuya obtusa*).

pisifera (Pea-fruited *Retinispora*). A smaller and more slender-growing species than the preceding,



CUPRESSUS PISIFERA SQUARROSA (*syns.* RETINISPIRA SQUARROSA AND CHAMAECYPARIS SQUARROSA).

but its numerous vars. prove generally hardier than those of obtusa. The best are, perhaps, aurea, filifera, filifera aurea, filifera gracilis, plumosa, p. albo-picta, p. argentea, p. aurea, sulphurea, and squarrosa (*syn.* *Retinispora squarrosa*) (*syns.* *Chamaecyparis*, *Thuya*, and *Retinispora pisifera*).

sempervirens, the well-known Cypress referred to by the older authors, and valuable for its effect when skilfully planted. The columnar var. is generally preferred (*syn.* horizontalis, etc.).

thyoides (White Cedar), 70', long introduced into this country, but requires a wet, or at least damp, soil. The following forms are very desirable, and are to be preferred for garden purposes: ericoides (*syn.* *Retinispora ericoides*, *Gord*, not *Veitch*); leptoclada, one of the most prized (*syn.* *Retinispora leptoclada*); and variegata. Others are aurea, fastigiata, glauca (*syn.* leptoclada), nana, pendula, and pygmæa (*syns.*

Cypia (in part, *see* *Randia*).

Cupidone (*see* *Catananche*).

Chamæcyparis sphæroidea and *Retinispora ericoides*).

Other Species :—

<i>Benthani</i> , rather tender (<i>syn. lusitanica</i> , of Carr, not Mill),	40', rather tender (<i>syn.</i> <i>glauca</i>).
— <i>arizonica</i> , 40',	<i>macnabiana</i> , 30', quite hdy.
<i>goweniana</i> , 50' hdy., but short-lived.	<i>torulosa</i> , 80', not hdy. except in the south;
<i>lusitanica</i> (Cedar of Goa),	<i>var. corneyana</i> .

CURATELLA.

Evergreen shrubs from South America (*ord. Dilleniaceæ*), requiring the temperature of a stove. They have ornamental leaves and white flowers. Cuttings root readily in sandy soil in a propagating case. A compost of fibrous peat and loam, with a fair amount of sand and good drainage, meet their requirements.

Principal Species :—

<i>alata</i> , 18', spr., wh.	<i>americana</i> , 10', Ap., wh.
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CURCULIGO.

Easily managed stove foliage plants (*ord. Amaryllidææ*), with long, wide, plaited or ribbed leaves. The flowers are usually yellow, borne on short racemes, and almost hidden by the density of the leafage. Propagation is easily effected by division of the stools in spring. Turfy loam, with an addition of leaf mould or peat, and a good dash of coarse sand, suits. As abundance of water is required, good drainage is essential. By liberal feeding, plants may be kept in the same pots for several years.

Principal Species :—

<i>latifolia</i> , 3' to 4', sum., yel.	<i>recurvata</i> , 3' to 4', sum., yel.
<i>plicata</i> , 2' to 3', sum., yel.	— <i>variegata</i> .

Other Species :—

<i>orchioides</i> , 2', Je., yel.	<i>seychellensis</i> , 2½', Je., yel.
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CURCUMA.

Tropical herbaceous plants (*ord. Scitamineæ*) remarkable for their dense, upright spikes of bright-coloured flowers, each flower being surrounded on three sides with a large, leafy bract, the spike being crowned with a number of highly coloured bracts. They are deciduous, and have small, tuberous roots. They are widely distributed throughout the Old World Tropics. Propagation is effected by division of the roots. A mixture of turfy loam and peat, with a good quantity of silver sand, forms a suitable compost. While growth is active a moist stove temperature is required, giving a little less heat and a drier atmosphere as the leaves die away.

Principal Species :—

<i>australasica</i> , 1', Je., yel., upper bracts red.	<i>roscoeana</i> , 2' to 3', Aug., sc., upper bracts or. red.
<i>cordata</i> (<i>see petiolata</i>).	<i>Zedoaria</i> , 3', My., Je., yel., upper bracts ro., wh.
<i>petiolata</i> , 1½', Sep., yel., upper bracts ro. pur.	

Other Species :—

<i>albiflora</i> , 1', Jy., wh.	<i>rubescens</i> , 1', My., yel.
<i>elata</i> , 2' to 3', My., crim.	<i>viridiflora</i> , 2', Jy., yel. grn.
<i>longa</i> , 2', Jy., yel.	

CURRENT, RED and WHITE.

Description.—Hardy deciduous shrubs (*ord. Saxifragææ*) the fruits of which are highly prized for dessert, preserving, and culinary purposes. Red and White Currants (*Ribes rubrum* and *r. album*) are successfully grown as open bushes, low

standards, and trained trees on walls and fences. Black Currants require different treatment from the above, and are dealt with separately.

Propagation.—From cuttings in the autumn. Select young shoots about 1' long, and cut just below a bud. Remove the buds down the stem with the exception of three or four at the top. This is done in order to secure a bush with a clear stem above the ground. Insert the cuttings about 6" deep, in rows, pressing the soil firmly round them. When the cuttings are rooted, and shoots have formed from the buds left, the bushes may be transplanted.

Soil.—Deep, well-drained soil in an open situation is the best. Water-logged land should be avoided.

Pruning.—Red and White Currants produce fruit on spurs, and the early training of the bush is to obtain from six to ten main branches radiating from the stem at equal distances. If the side shoots are kept cut back spurs are formed, and each branch becomes a cordon of fruit. Summer pruning is advised, and this consists of taking out the points of the leading shoots and pinching back the side growths to within three or four leaves of the base, in June. At the winter pruning the side shoots are spurred back closely, and the leading growths left about three parts their original length. When grown on walls several main branches are laid in at equal distances, and side and leading shoots pruned on the lines suggested.

Other Cultural Points.—The finest fruit is obtained when the bushes are adequately fed. In the early spring a dressing of decayed manure should be applied and lightly forked in. A good substitute for the above is 4 lb. of superphosphate and 3 lb. of kainit per square rod, hoed into the surface soil in February. When bearing crops, liquid manure increases the size and improves the colour of the fruit. If protected with nets the fruit will hang till the end of the summer, and Currants may be picked late in the autumn from trees grown on a north wall. Low standard Currants are useful for growing beside garden paths, with other crops beneath them. They are obtained by confining the growths to a single stem supported by a stake, and when about 4' high cutting off the top. The head is formed from the shoots which break out just below.

Enemies.—*Aphides*.—These pests attack the tips of the shoots and cause the leaves to blister and curl. The best remedy is to nip out the points of the shoots and burn them. (For other remedies, *see* APHIDES.)

Birds.—Havoc is often played by small birds taking the buds in the spring. Dusting the bushes with soot and lime is one of the best remedies.

Clearwing Moth (*Sesia tipuliformis*).—The sudden death of Currant shoots is frequently traced to the larva of this moth, which works its way down the centre of the shoots and feeds on the pith. The caterpillars are yellowish white, with dark coloured heads. Insecticides are useless, and the only remedy is to cut out affected shoots and burn them, and destroy the caterpillars when seen.

Maggie Moth (*Abraaz grossulariata*).—The larvæ of this pretty moth feed on the leaves of both Currants and Gooseberries, and will soon defoliate bushes if left unchecked. Eggs are laid on the leaves, and the caterpillars commence to feed as soon as they appear. To prevent and destroy, spray the bushes with petroleum emulsion, and dust the shoots, when damp, with soot.

Sawfly (Nematus Ribesii).—Gooseberries are the worst sufferers through the larvæ of the sawfly, but Currants are often attacked as well. (For remedies, see GOOSEBERRY ENEMIES.)

A Selection of Varieties :—

Red :—
Comet. Cherry. Raby Castle. Red Dutch.
White :—
White Dutch. White Versailles.

CURRENT, BLACK.

No bush fruit is more highly prized for culinary and preserving purposes than the Black Currant (*Ribes nigrum*), and its value in this respect is greater than that of the Red and White forms.

Propagation.—From cuttings in the autumn, the same as Red Currants, with the exception that no buds are removed from the stem. The idea is not to obtain a bush with a clear stem, but to get as many young growths from the base as possible.

Soil.—A cool, retentive loam in a rather moist situation suits Black Currants. Dry, poor land is unfavourable. Their love of moisture is illustrated by the luxuriant manner in which bushes grow in low situations, and by pools and streams.

Pruning.—The pruning of established Black Currants is exactly opposite to that of the Red. Fruit is chiefly borne on young shoots of the previous year's growth; and pruning consists of cutting out the old wood, and encouraging as much new growth as possible. Always avoid overcrowding. Strong sucker growths from the base should be encouraged, as they invariably produce fine fruit.

Other Cultural Points.—There must be no stint of manure if Black Currants are to be remunerative. Dung, spread on the surface and lightly forked in, is excellent, and artificials may also be used with advantage. Basic slag and bone meal are good for winter dressings on heavy soils, and in February or March apply 4 lb. of superphosphate, 2 lb. of kainit, and 1 lb. of sulphate of ammonia per square rod; hoe it in. Avoid digging deeply between the bushes, or the fibrous surface roots will be destroyed.

Enemies.—*Bud Mite (Phytoptus Ribis).*—This is by far the most destructive pest of the Black Currant, and its eradication is difficult. Its presence is apparent from November onwards in the form of swollen and malformed buds. The swelling is due to the irritation set up by the microscopic mites feeding within. These buds fail to develop and produce fruit. Out of the many remedies adopted none has proved to be absolutely effectual, but the following have been tried with varying degrees of success: Pull up and burn badly infested bushes, and avoid planting again on the same site. Check the spread of the evil in an early stage by hand-picking swollen buds. Do not plant Black Currants in large areas, but in single rows, interspersed with Gooseberries or Raspberries. Allow poultry a free run of the plantation. Experiments have been made by enclosing bushes under an air-tight canvas tent in the winter, placing a vessel inside containing 4 oz. each of water and sulphuric acid, and dropping in $1\frac{1}{4}$ oz. of cyanide of potassium. This is said to destroy the mite, but its absolute efficacy is not yet proved. The operator must keep outside the sheet. Propagating from infected stocks should be rigidly avoided.

A Selection of Varieties :—

Baldwin's Black. Champion.
Black Naples. Lee's Prolific.
Boskoop.

CURTISIA.

An evergreen tree (*ord.* Cornaceæ), requiring the protection of a cool greenhouse. The one species known has very hard wood, and has gained the name of Assegai-tree, through the natives of South Africa using the wood largely as shafts for weapons. It can be grown from cuttings, and likes an open mixture of fibrous loam and leaf mould.

Only Species :—

faginea, 30', sum., wh.

CUSCUTA.

Tropical, sub-tropical, or hardy parasites (*ord.* Convolvulaceæ), of herbaceous habit, with thin, wiry, leafless, climbing stems, and small, sometimes pretty, flowers. Several species are British, and grow on almost any soft-stemmed plants, being very partial to Clover, Flax, Oats, Thistles, etc., in some districts almost ruining crops. Seeds of desirable species should be sown with seeds of the host plants. By sowing seeds in ordinary soil without a host plant near, the young plants die in about a week from the time of germination. **Host Plants.**—In addition to those mentioned above, the Chickweed, Geranium, Heath, Thyme, and Tomato are suitable.

Principal Species :—

americana, sum., st., wh. europæa, Jy., hdy., wh.,
australis, Aug., grh., wh. on Thistles, Oats, etc.
Epilinum, Jy., hdy., wh., Trifoli, Jy., hdy., wh.,
on Flax. on Clover; a form of
Epithymum, Jy., hdy., Epithymum.
wh., on Heath and Thyme.

CUSSONIA.

Evergreen shrubs or small trees from South Africa (*ord.* Araliaceæ), with ornamental, Aralia-like leaves, thick, fleshy stems, and inconspicuous, greenish flowers. Increased by cuttings in a similar way to Aralias. They thrive in good, fibrous loam, and the best results are obtained by planting in a conservatory or greenhouse.

Principal Species :—

Kraussii, 15' to 20', Jy., paniculata, 15', Jy., grn.
grn., lvs. large, glaucous.

CUTTINGS.

Cuttings are portions of plants, which, under favourable conditions, emit roots and perpetuate their parent. Where plants absolutely identical with the parent are required, cuttings furnish the most reliable way of obtaining them, as, though "sports" are occasionally produced by cuttings, as in the Chrysanthemum, yet the tendency is rare. Seeds, on the other hand, exhibit a marked predilection for producing varieties which often differ greatly from the plants yielding them.

Cuttings are generally formed of the growing point of a shoot, severed just below a leaf, which leaf, with the next one or two above it, is removed, and the base of the cutting buried about 1" deep in very sandy soil. Cuttings should be taken from plants which are in the best possible health, and should be as perfect specimens as obtainable.

Cuttings are used impartially for the propagation of both hard- and soft-wooded plants, but may be usefully supplemented in the case of such plants as Bouvardias, Crotons, Dracænas, Fuchsias,

Custard Apple (see Annona).

Geraniums, Poinsettias, etc., by cuttings formed from portions of the stem after the growing point has been removed. The usual practice is to wait for back buds to break after the growing point of a shoot has been removed; they are then made into cuttings. There is no real need for this, as, where the shoot can be spared, it may be severed almost at its base, and every portion containing two or three eyes utilised as a cutting.

Bottom heat, especially that furnished by a hot-bed, greatly facilitates the emission of roots in soft-wooded plants; for hard-wooded plants it is not recommended to be used until the cuttings have formed a callus at their base in a cool house or pit, when they quickly send forth roots on the application of a little bottom heat.

Propagation by means of leaf cuttings is readily effected in the case of such plants as Rex Begonias, Gesneras, Gloxinias, and Saintpaulias. The process consists of making a notch in the midrib, and bringing this into contact with a bed of light, sandy soil; or by inserting the leaf by its base, near the edge of a pot, in the manner practised with stem cuttings.

Many plants may be propagated by means of root cuttings, which are cut into lengths varying from 1" to 3", and placed 1" or so below the surface of pans of sandy soil. A few of the plants lending themselves to this manner of propagation are Acalyphas, Aralias, Bouvardias, Dracaenas, Clematisses, Passifloras, and Hellebores.

Eyes, consisting of a small portion of the stem, with one leaf and an axillary bud, are used as cuttings in some instances; mostly in the propagation of the Vine, though Dracaenas and Dieffenbachias are also increased in this manner.

Cuttings of fruit trees, such as Gooseberries and Currants, are best inserted in October and November; using shoots of the current year, detached if possible with a heel, and inserting firmly on a border having a northern aspect.

CYANANTHUS.

A genus of about eight species of hardy herbaceous plants (*ord.* Campanulaceæ), of considerable beauty, and much prized for rock gardens. They thrive in a sunny position in light, moist, sandy peat. A mulch of about 1" of sand during winter is beneficial. They are propagated by seeds and cuttings, the former sown in pots in a frame in spring, and the latter made from the young growths, also in spring.

Principal Species :—

incanus, 4", Aug., light bl. lobatus, 4", Aug., pur. bl.

Other Species :—

barbatus.	inflatus.	microphyllus.
Hookeri.	integer.	pedunculatus.

CYANELLA.

Pretty little bulbous plants, generally included in the *ord.* Liliaceæ, but classed with the Hemodoraceæ in the *Index Kewensis*. They are almost hardy, and may be treated like the Ixia, or grown in a frame like many other of the smaller Cape bulbs. Increased by seeds and offsets.

Principal Species :—

alba, 1', Jy., wh.	lineata, odoratissima,
capensis, 1', Jy., bl.	and rosea.
lutea, 1', Jy., yel., vars.	orchidiformis, 1', Aug., bl.

CYANOPHYLLUM.

A genus (*ord.* Melastomaceæ) now merged in *Miconia*. They are soft-wooded, ornamental

foliage shrubs requiring stove heat. They are propagated by means of cuttings placed in sandy soil in a warm case, and grow readily in a mixture of fibrous peat and loam, with a liberal addition of silver sand. (For fuller description and list of species, see *MICONIA*.)

CYANOTIS.

Tradescantia-like herbs (*ord.* Commelinaceæ), from 1" or 2" to 1' or more in height, with fleshy stems and leaves, and crowded heads of blue, purple, or rose flowers, from South Africa, India, etc. They root quickly from cuttings, and grow in an intermediate temperature in well-



GIANT WHITE CYCLAMEN. ONE YEAR FROM SOWING THE SEED (see p. 264).

drained soil in pans or borders. They should be replanted every spring.

Principal Species :—

kewensis, spr., cl., ro. somaliensis, 2", sum., bl.

CYATHEA.

Evergreen tree Ferns (*ord.* Filices), suitable for stove or greenhouse, from tropical and sub-tropical regions. The numerous species vary greatly in habit, some making short, thin stems, 2' to 3' high, with fronds the same length; others stout stems 15' to 20' in height, with fronds upwards of 15' long and 4' wide. The fronds of some form wide-spreading, flattened heads, as in *Dicksonia*, and, like many of that genus, are produced, a large number at a time, once a year. Others, as in *medullaris*, produce upright fronds three or six together two or three times a year. The growth in height of some species is very slow, whilst

Cyanothamnus (see *Boronia*).

others add from 9" to 12" to their height annually. Propagation is by means of spores, as in other Ferns. Soil, fibrous peat two parts, fibrous loam one part, with a good quantity of coarse sand. They may be grown in pots, tubs, or borders, the last method being the best. When the roots are confined feeding is necessary, cow manure in a liquid state, with an occasional application of soot water, being the best fertiliser. When planted out thorough drainage is essential, and large stones should be mixed with the soil to aid in keeping it sweet and open. When growth is active, abundance of fresh water must be given, providing any surplus moisture can drain away quickly. A moist atmosphere should be maintained, and the stems kept moist by means of the syringe.

Principal Species :—

dealbata, 8' to 10', fronds 4' to 6'.
Dregei, 12', fronds 3'.
insignis, 10' to 12', fronds 4' to 5'.
medullaris, 20', fronds 15'.
serra, 12', fronds 5'.
spinulosa, 2' to 3', fronds 2'.

Other Species :—

arborea, 15', fronds 8'.
Hookeri, 6', fronds 4'.
mastersiana, 3' to 4', fronds 2'.
microphylla, 3' to 4', fronds 2' to 3'.
pubescens, 5', fronds 2' to 3'.
pygmaea, 2', fronds 1½'.
Tussacii, 3', fronds 2'.

CYATHODES.

Greenhouse evergreen shrubs or trees (*ord.* Epacridae), from Australia, New Zealand, etc., compact in habit, with small, Heath-like leaves and yellow or white flowers. Increased by means of cuttings inserted in sandy peat and placed in a cool propagating case. They require to be grown in well-drained pots in sandy peat.

Principal Species :—

acerosa, 8', Ap., My., wh. *glauca*, 20', Ap., Je., wh.

CYCAS.

Description.—An ornamental genus (*ord.* Cycadaceae), consisting of dwarf, slow-growing, evergreen plants, with short, usually unbranched, cylindrical stems, terminated by a handsome head of long leaves. The male flowers are borne in cones, and consist of mere scales bearing anthers on their under side. The female cones are produced from the crown inside the head of leaves, and consist of a large mass of woolly, scale-like leaves carrying the ovules. All are useful plants for the decoration of large conservatories or stoves, but are out of place in small structures. They are natives of the warmer parts of Eastern Asia, Australia, etc. From the pith of *revoluta*—a Japanese plant—a kind of starch and sago is prepared, sago also being furnished from the seeds of *circinalis*.

Propagation.—Seeds sown in sandy soil in a temperature of from 60° to 70° germinate in a few weeks' time, but, as the plants grow so slowly, this method is only employed in the case of very rare species; in almost all cases mature stems are imported. Propagation is also effected by scales.

Soil.—Good fibrous loam and coarse sand.

Other Cultural Points.—Repotting is required at rare intervals only, consequently the pots or tubs must be well drained, and only the best of soil used. If they can be planted in a border they will grow more quickly and give less trouble in the way

of watering and cleaning. When growth is active they require plenty of water, but may be kept drier as the leaves mature. Throughout the spring and summer they should be well syringed daily. Several species are favourable host plants for mealy bug and scale; to keep these down, frequent syringing with an emulsion of soft soap and paraffin is necessary.

Principal Species :—

circinalis, 8', lvs. 9' to 10'.
revoluta, 8' to 10', lvs. 5' to 6'.
siamensis, 4', lvs. 3' to 4'.
tonkinensis, 5', lvs. 5' to 6'.

Other Species :—

celebica, 5', lvs. 7' to 9'.
media, 12' or more, lvs. 5'.
normanbyana, 6', lvs. 5'.
Rumphii, 6', lvs. 5'.
Seemannii, 7', lvs. 5'.

CYCLAMEN.

Description.—Greenhouse or hardy perennial, deciduous herbs (*ord.* Primulaceae), with long-stalked, roundish leaves, growing in tufts, from thick, flattened rootstocks. The genus is essentially ornamental, several species being among the best of greenhouse and hardy winter-flowering plants. In most cases the flowers are showy, ranging in colour from white to reddish purple. The leaves are deep green, often prettily marbled with pale green or silver. The species most commonly grown under glass is *latifolium* (*syn.* *persicum*). This in itself has the finest flowers of all the species, but by crossing and selection it has been greatly improved until it has now attained to a very high order of merit. There are many distinct strains which come true from seeds. During recent years two forms have been introduced, which have crested flowers and leaves respectively. The hardy species are suitable for a variety of purposes. They may be grown in pans for flowering in a cold greenhouse, planted in a shady place on the rockery, or naturalised in cool, shady places in the wild garden or woodland. The flowers begin to appear soon after the leaves die away in autumn, and are produced throughout the winter until the leaves are well advanced in spring. Throughout summer the leaves make a dense carpet a few inches deep, forming a striking contrast to other things.

Propagation.—Seeds should be sown from August to October in well-drained pans of sandy loam, and covered with their own depth of finely sifted soil. The pans should be covered with a sheet of glass, and stood in a temperature of from 55° to 60°, shading from bright sunshine until germination takes place. As soon as the young plants are well above the soil, the hardy ones should be removed to a cool frame, and the indoor ones left in the same house, both being stood as near as possible to the glass to prevent "drawing." When the first leaf is well developed they should be pricked out into pans, leaving 1" between each two plants, or they may be put singly into thumb pots.

Soil.—Good fibrous loam three parts, leaf mould one part, and coarse sand one part.

Other Cultural Points.—When four leaves have been made the plants should be potted singly into 3" pots, and left, as before, in a light place in the house or frame. The indoor ones should stay in the warm house until they are well established in 3" pots, after which they should be stood in a cool house or frame having an ash bottom, and from which the lights can be removed if necessary. By

July they will be ready for their final pot, the strongest being put into 6" and the others into 5". They must be stood back in the house or frame and kept there until September. While growing they should be syringed lightly, both above and underneath the leaves, early in the afternoon, and shut up early. During very bright sunshine a light shading is necessary. As the plants show signs of maturity, about August, more air must be given, the lights being removed at night, so that the full benefit of the moist night air can be obtained. In showery weather the lights must not be removed. When the pots are well filled with roots, liquid manure may be given once or twice a week. The flower buds should be pinched out as they rise

Principal Species and Varieties:—

Tender:—

latifolium, 6" to 9", win., — giganteum, strong.
red, wh. (*syn.* persicum). persicum (*see* latifolium).
— albiflorum, wh.

Hardy:—

Coum, 4", win., pur. neapolitanum, 4", win.
europæum, 4", win., red. red.
ibericum, 4", win., red. — album, wh.

Other Species:—

africanum, 6", aut., red, græcum, 4", aut., wh., pur.
wh. hederæfolium, 4", win.
alpinum, 3", win., red, pur. pur.
Atkinsii, 4", win., pur. repandum (*see* hederæ-
wh. (garden hybrid). folium).
cilicium, 4", aut., ro., wh. tauricum, 4", win., red.



Photo: Cassell & Company, Ltd.

CYCLAMEN LADY ROBERTS (soft pink).

above the leaves until November; the plants will then continue to flower for at least three months, especially if old flowers are kept removed. By bringing plants into a little extra warmth at intervals of a few weeks in September and October an extended flowering period is gained. Though a perennial, latifolium is commonly treated as a biennial, the best results being obtained in this way. If it is thought advisable to keep plants on for a third season, they may be partially dried and rested after flowering. In June the old soil should be shaken away, the plants potted and treated as seedlings. Some successful growers do not practise this drying-off, but keep the plants growing. The hardy species must be kept in pots until sturdy enough to look after themselves, when they may be planted out in well-drained, loamy soil in irregular patches in places similar to those mentioned earlier.

CYCLANTHUS.

Tropical American evergreen shrubs (*ord.* Cyclanthaceæ) resembling a Palm in habit. They have very short, contracted stems, with heads of fan-shaped leaves, which have a division in the centre of each. The flowers are inconspicuous and unisexual, male and female being arranged in alternate bands. Similar treatment to that given to stove Palms or Pandanus suits.

Principal Species:—

bipartitus, 5' to 6', stem cristatus, lvs. 5', stem a few inches long. a few inches long.

CYCLOBOTHRA.

Charming bulbous plants (*ord.* Liliaceæ), now included with Calochortus, and described under that title in this work

CYCLOPIA.

South African shrubs (*ord.* Leguminosæ), with small leaves and yellow, Broom-like flowers. They should be treated like the greenhouse species of *Cytisus*. *Genistoides*, 2', April, yellow, is the principal species.

CYCNOCHES. (SWAN ORCHID.)

Description.—In very few genera are the curious and the beautiful so well joined as in *Cynoches*



CYCNOCHES BARBATUM.

(*ord.* Orchidaceæ), the members of which are generally known as Swan Orchids, owing to the gracefully arched column representing the neck and head, and the reflexed sepals and petals representing the body of a swan.

Cultural Points.—So closely allied are these Orchids to *Catasetums* (which *see*) that they thrive under similar conditions. Briefly stated, they need a season of decided rest; they should be grown in a stove, and baskets are better than pots; moss, crocks, and a little fibrous peat form a suitable rooting medium. Water freely when growth is vigorous. Propagate by dividing the pseudo-bulbs.

Principal Species :—

chlorochilum, 2', Je., greenish yel. *pentadactylon*, 1½', Meh., Ap., yel., br. Handsome when in flower.

Other Species :—

aureum, 1', yel. *egertonianum*, 2', aut., pur., grn., pk.
barbatum (correctly *Polycynis barbata*). *Lehmannii*, 9', aut., salmon, or. (*now* *Lueddemannia Lehmannii*).
Cummingii, 1', Je., wh., yel.

Cyclodium (*see* *Aspidium*).

Cyclonema (*see* *Clerodendron*).

Cyclopeltis (*see* *Aspidium*).

Cymation (*see* *Ornithoglossum*).

Loddigesii, 1', My., br., wh., pur.
— *leucochilum*, 1', Je., yel., wh.
maculatum, 1', Je., buff, pur.
musciferum, 1', spr., br. (*now* *Polycynis musciferum*).
peruvianum, 9', My., Je., grn., pur., br., wh.
Pescatorei (*now* *Lueddemannia Pescatorei*).
rossianum, grn., wh.
ventricosum, 2', Jy., Aug., grn., yel., wh.; sweet.
versicolor, 1', Je., Jy., grn., br., wh., yel.
Warszewiczii, 1', Oct., grn.

CYDONIA. (QUINCE.)

Hardy, deciduous shrubs or trees (*ord.* Rosaceæ), now included with *Pyrus* (which *see*).

CYLISTA.

Tropical climbing plants (*ord.* Leguminosæ), with woody stems and bright yellow and red, Pea-shaped flowers, requiring a stove temperature and plenty of room. Cuttings may be rooted in sandy soil in a warm, close case. A mixture of fibrous loam and peat suits.

Principal Species :—

scariosa, 4', My., yel., red. *villosa*, 6', Ap., yel.

CYMBIDIUM.

Description.—Not many of the thirty or more species of *Cymbidium* (*ord.* Orchidaceæ) described are of first rate horticultural value, but those of more than botanical interest are among the most popular of Orchids. All are evergreen, and of tufted habit, the leaves being long and gracefully recurved, proceeding in some cases from short, thick pseudo-bulbs. The flowers are of large size, fleshy, and very lasting; in the case of *eburneum* they are white, and usually borne singly on erect peduncles; in *lowianum* they are numerous, and carried on an arching spike 3' long.

Cultural Points.—Most of the species grow and flower best in an intermediate temperature, but *lowianum* is essentially a cool Orchid, and it is only since it has been treated as such that it has

CYMBIDIUM LOWIANUM (*see* p. 267).

become really popular. It suffers no harm if it experiences a degree or two of frost during mid-winter, though a minimum temperature of 45° should be provided. Having thick, fleshy roots, *Cymbidiums* require fairly large receptacles, and

pots are better than baskets. Good drainage and a mixture of fibrous peat and loam, rather lumpy, suit them well. It is difficult to over water established plants during the growing season, but at other seasons a reduced supply suffices. The warmth-loving species especially need careful attention when repotted, or they will damp and rot speedily. Though a Cymbidium spike will carry its flowers over a period of three months, growers should not allow floral duration to blind them to the plant's needs. Soon after all the buds have expanded, cut the spike, and place the cut end in a vessel of water stood among the plants or in the drawing-room. For floral designs the best Cymbidiums are extremely popular. Two very fine hybrids are in cultivation, and hybrids are yearly becoming more plentiful. Lowio-eburneum and eburneo-lowianum are both strong growers, and easily managed in a cool intermediate house.

Principal Species and Hybrids :—

eburneo-lowianum, 1½', Feb., Ap., creamy wh., crim. blotch on lip.
eburneum, 1½', Feb., Mch., wh., yel. crest.
— Williamsii, 1½', Feb., Mch., wh., pur.
giganteum, 2½', win., grn., yel., pur., crim.
grandiflorum, 2', win., yellowish grn., yel. crim. (*syn. hookerianum*).
lowianum, 2½', yellowish grn., lip crim., yel., maroon.

Other Species :—

affine (*see Cyperorchis Mastersii*).
aloifolium, 1', Sep., pur., blk.
canaliculatum, 1½' Ap., My., blackish pur.
cyperifolium, 1½', Oct., Nov., grn., red br.
devonianum, 1' Ap., My., greenish yel., crim., pur.
elegans (*see Cyperorchis elegans*).
ensifolium, 1', win., grn., wh., red, yel.; sweet.
hookerianum (*see grandiflorum*).
Humboldtii, 1½' to 3', Je., yellowish grn., brownish blk.

CYNANCHUM.

Hardy or tender climbers (*ord. Asclepiadæ*), with herbaceous or sub-shrubby habit, small leaves, deciduous or evergreen, and small, red, rose, or white flowers in umbels. They are increased by division of the stools in spring, and grow readily in any good soil. The tender species are rarely seen in cultivation, a few of the hardy ones sometimes being found in collections of herbaceous plants. The majority are from Southern Europe and Western Asia.

Principal Species :—

bicolor, 6', sum., st., wh. (now *Damia extensa*).
formosum, 5', Jy., grn., grn.
macrochizon, 6', Jy., hdy., wh.

— viride, grn.
Lowio-eburneum, 1½', Feb., Mch., ivory wh., tinged grn.
tigrinum, 9", Ap., Je., olive grn., red, striped pur.
traceyanum, 2½', win., yellowish grn., marked crim.; lip yellowish wh., spotted crim.
winnianum, 2', win., wh., spotted crim. A hybrid between eburneum and giganteum.

Huttonii, 1½', My., yel. grn., chocolate. Very rare.
I'Ansonii, 1½', My., grn., lip wh., yel.
longifolium, 2', Nov., grn. Mastersii (*see Cyperorchis Mastersii*).
Parishii, 1½', Jy., Aug., wh., or., spotted vio. pur.; sweet.
pulcherrimum, 1', Nov., Dec., wh., crim.
pendulum, 2½', Jy., Aug., yellowish grn., red.
— atropurpureum, 2½', My., Je., pur., lip wh., ro.

melanthos, 3', Jy., hdy., pur. (now *Vincetoxicum medium*).
roseum, 3', Jy., hdy., pur.
viridiflorum (now *Tylophora asthmatica*).

CYNARA.

A genus (*ord. Compositæ*) comprising six species of prickly herbaceous perennials, resembling Thistles in appearance. Although decorative, they are rarely grown for the sake of ornament, but chiefly for their economic properties. Cardunculus is the Cardoon, and is treated under that head. Scolymus—probably only a cultivated variety of Cardunculus—is the Globe Artichoke, which *see*. When grown in the herbaceous border Cynaras like rich, but light, and well-turned soil. A little protection in winter is advisable. They are capital subjects for shrubbery margins.

Principal Species :—

Cardunculus, 5' to 6', Scolymus, 3' to 7', aut., Aug., Sep., pur.
— horrida, 6', Aug., Sep., pur.

CYNOGLOSSUM. (HOUND'S TONGUE.)

A rather extensive genus of border or rock plants (*ord. Boraginæ*), of which only a few are in cultivation. It is thus needless to name many. They have racemes of funnel-shaped flowers. They thrive in common soil, and are propagated by seeds sown in spring in the open, or in a frame, and by division in spring or autumn. There are annual, biennial, and perennial species.

Principal Species :—

cheirifolium, 9", Je., bien., nervosum, 3', My., per., bl. ro. officinale, 2', Je., bien., pur.
Dioscoridis, 2', Je., bien., red. pictum, 2', Aug., bien., pur.
furcatum, 1½', Je., bien., bl. glochidiatum, 2', Je., virginicum, 4', Jy., per., bien., bl.

CYNOMETRA.

Evergreen trees (*ord. Leguminosæ*), requiring a stove temperature. Upwards of twenty species have been described, but they are not in general cultivation. The brown pods are edible. The plants like a sandy loam, and propagation is by cuttings of tips of the half-ripened shoots in spring, in a sandy soil, in a close frame.

Principal Species :—

cauliflora, 30' to 40', sum., wh.

CYNORCHIS (*syn. CYNOSORCHIS*).

Terrestrial Orchids (*ord. Orchidaceæ*) needing stove heat. Of the sixteen species several are in cultivation, but they are of little value. Fibrous loam and peat, with sand and a surfacing of sphagnum, form a good compost. Propagation is by division, carried out just before the plants start into growth. Give plenty of water during the growing season, and little or none during the period of rest.

Principal Species and Varieties :—

elegans, 4' to 5', wh., ro., — purpurea, pur.
lvs. grn. lowiana, 1', wh., grn., lip lil.
grandiflora, grn., spotted pur.
ro., pur. purpurascens, 8' to 10', Nov., grn., red, ro.
— alba, wh., lip pur., fragrant.

CYPELLA.

Pretty, half-hardy, bulbous plants (*ord. Iridææ*), which require the same treatment as Ixias, and are increased by offsets.

Principal Species :—

Herbertii, 1', Jy., yel. (*syn. plumbea*, 3', Aug., bl. (*syn. Tigridia Herbertii*).
peruviana, 1', yel., spotted br. Phalocallis plumbea).

CYPERORCHIS.

A small genus (*ord.* Orchidaceæ) of two or three species of stove epiphytic Orchids, at one time referred to *Cymbidium*, and answering to the same treatment as the members of that genus.

Principal Species :—

cochlearis, lvs. 2' to 3',
grn., br., yel. (*syn.*
Cymbidium cochleare).
elegans, lvs. 1½' to 2',
sulphur yel. or cream
wh. (*syn.* *Cymbidium*
elegans).
Mastersii, win., ivory wh.,
like *Cymbidium eburneum* in habit (*syn.*
Cymbidium Mastersii
and *C. affine*).
— *album*, win., wh., frag-
rant (*syn.* *Cymbidium*
Mastersii album).

CYPERUS.

A genus containing a large number of Grass-like plants (*ord.* Cyperaceæ) principally of ornamental habit, and of much horticultural value. Many are adapted for table decoration. Propagation is by



Photo : J. Corbett.

CYPRIPEDIUM CHARLESWORTHII (*see* p. 270).

division in spring, by seeds sown in spring in heat, and, with some species, by rooting the tops of the plants. Soil, rich loam and sand with a little peat added. Nearly all the species like a good supply of moisture, and some thrive best as sub-aquatic plants. When grown in windows it is particularly necessary to see that they never suffer from drought.

Principal Species and Varieties :—

alternifolius, 2½', valuable
grh. or window plant.
— *variegatus*, lvs. and
stems striped wh.
— *variegatus gracilis*.
longus, 4', aut., a pretty,
Other Species :—
aristatus, 6", ann.
compressus, 1', grn.
elegans, 7', Jy. (*syn.* *Papy-*
rus elegans).
esculentus, hlf-hdy.
hdy. species for the
borders of ponds and
similar positions.
Papyrus, 10'. Aug. (Proper
name of *Papyrus Anti-*
quorum).
giganteus, 10', Jy. (*syn.*
Papyrus odoratus).
laxiflorus, 7', Jy.
laxus, 3', good table plant.
— *variegatus*.
reflexus.

Cynips (*see* *Rose Bedeguar*).

CYPHIA.

Half-hardy herbaceous perennials (*ord.* Campanulaceæ), thriving in loam, peat, and sand in equal proportions, and increased by cuttings of the young growths under a hand-glass in a cool frame in spring. Some of the species have tuberous roots, and these should be kept dry in winter, or the tubers will rot. Most of the *Cyphias* are natives of the Cape. They are rarely met with in cultivation.

Principal Species :—

bulbosa, 6", Aug., pale bl.
Cardamines, 6", Jy.
Phyteuma, 3", Feb., pk.
volubilis, bl., stems twin-
ing.

CYPHOKENTIA.

There are five species in this genus (*ord.* Palmæ). All need a stove heat, plenty of moisture both at the root and in the air, and a little liquid stimulant during the summer. They may be increased by seeds. Soil, good loam.

Principal Species :—

robusta, graceful, finely divided leaves.

CYPHOMANDRA. (TREE TOMATO.)

There are nearly forty species in this genus (*ord.* Solanaceæ), and the one worthy of the greatest attention is *betacea*, the Tree Tomato. This attains to the dimensions of a small tree (12' to 14'), with a stout, woody stem, and a great spread of branches. The fruits are as large as good-sized Plums, egg-shaped, purple at first, finally red when ripe, and produced in pendulous strings. When cooked they form a tasty dish. The plant likes a compost of loam and leaf soil, with sand, and a warm greenhouse temperature. It may be increased by seed, or by cuttings, in spring, in bottom heat.

There is a fine specimen at the southern end of the Temperate House at Kew.

Fragrans is also a useful and ornamental species. It can be kept dwarf, or grown to 15' in height, and bears drooping racemes of sweet purple and yellow flowers.

CYPHOSPERMA.

Stove Palms (*ord.* Palmæ), thriving under the same treatment as *ARECA*, which *see*. One species only has been introduced : *Vieillardii* (*syns.* *Kentia robusta* and *Kentia Vieillardii*). *Kentia robusta* is the common garden name.

CYPRESS (*see* **CUPRESSUS**).**CYPRIPEDIUM**

Description.—Among amateur Orchid cultivators there is no more popular genus than *Cypripedium*, for it is of easy culture, readily propagated, and lends itself freely to hybridisation. The plants vary from the low-growing bellatulum of 3" high to the robust longifolium, which is often 3' high, but most of them are terrestrial. The leaves vary from short, fleshy, flat ones to grassy, recurving ones 3' long, and in colour they show remarkable differences. With the exception of the hardy forms, all are evergreen. *Lady's Slipper* is the popular name, and the general idea is that the pouched lip forms the toe, the staminode the heel, the dorsal sepal the back, and the petals the straps of the shoe. In some cases, as in *Schlimii*, the petals are quite small, whereas in *caudatum* they are sometimes 2' long. The sepals and lip may assume many peculiar shapes, but no matter what the variation a *Cypripedium* is never mistaken for any

other Orchid, although there are between ninety and a hundred species and several hundred recorded hybrids.

Botanical Sections of the Genus.—In such a widespread genus it is natural to find distinctive groups of species, and while it may be advisable to give descriptive titles to such groups for purposes of classification, horticulturists are not prepared to accept such titles as strictly generic. Botanists made several groups of Cypripedium, but latterly they have defined these as separate genera. In this article the Lady's Slipper Orchids are all dealt with as Cypripediums, though according to latest advice they should be divided into four separate genera, *i.e.* Selenipedium, Phragmapedium, Cypripedium, and Paphiopeidium. Some go so far as to correct the original authority and alter "pedium" to "pedilum."

Hybrids.—Several hundred hybrids have been raised, and month by month the number increases. No Orchids are easier to raise from seed, and one instance is recorded of strong plants with leaves $4\frac{1}{2}$ " long having been produced within nine months of hybridisation. Seedlings flower early as compared with other Orchids, and hybrids are often a decided improvement upon the parents in floriferousness and ease of culture. Lecanum, calurum, cardinale, harrisianum, Morganie, and Sedenii are half a dozen splendid hybrids, well deserving of culture even where Orchids are not a speciality.

Cultural Points.—As considerable diversity of habit exists among Cypripediums, the cultivator must exercise judgment in providing receptacles. Deep-rooting sorts need deeper pots than the surface-rooting ones. Ample drainage is essential, and, as a general rule, fibrous peat, a little fibrous loam, and sphagnum-form a suitable compost. The bellatulum group require little rooting material, and they are the only species that have a decided period of rest, and need hardly any water during such period; a high stove temperature suits them, and they delight in limestone rock placed about their roots. Other tropical species are manageable in a winter temperature of 55° to 60°, rising to 70° during the summer, and allowing an advance of several degrees by sun heat. The best time to divide, repot, or top-dress Cypripediums is when new growth commences, usually in early spring. A humid atmosphere is essential at all times, and most species are the better for a gentle syringing during hot summer weather. A moderate amount of shading in brilliant weather is beneficial, and

ensures clean, bright leafage. A few species noted below can be grown in a cool house, and very many hybrids succeed admirably in the intermediate house, especially those having a cool-house species as one parent.

Insect Enemies.—If sponging is systematically done, and the houses are occasionally fumigated or vaporised, so much the better for the Cypripediums, as it is not easy to eradicate scale or mealy



Photo: Cassell & Company, Ltd.

CYPRIPEDIUM MORGANIE (see p. 270).

bug when once these have ensconced themselves in the leaf axils or round the rootstock. A humid atmosphere will keep red spider in check.

Hardy Section.—All the hardy species are terrestrial. A moist situation is essential. If a compost has to be prepared, it should be composed of equal parts of peat and flaky leaf soil, with sphagnum moss added if necessary, to ensure moisture. Division is the method of increase, but it is desirable to disturb the plants as little as possible. A spot sheltered from wind, such as a bay in the rock garden, should be selected as a home for these Lady's Slippers, and

if strong plants are put out in spring such a corner should prove one of the most delightful in the garden. The best of this section is spectabile.

Principal Tropical Species and Varieties:—

- Argus, 1', My., Je., wh., ro., grn., pur.
 barbatum, 9", Ap., wh., pur., grn. Of this there are several good vars., notably Crossii and nigrum.
 bellatulum, 3", My., Je., wh., spotted dark pur.
 — album, a choice and rare albino.
 Boxallii, 1½', win., grn., dark pur.
 callosum, 1½', Dec., Jan., Feb., wh., pur., grn.
 — Sanderæ, a beautiful albino.
 caudatum, 2', Mch., My., grn., yel., br. (with botanists, Selenipedium caudatum).
 Charlesworthii, 6", Sep., Nov., ro., wh., grn. (see p. 268).
 concolor, 6", Ap., My., creamy wh.
 Curtisii, 8", Je., Aug., pur., wh., ro.
 dayanum, 8", Feb., Mch., wh., grn., pur.
 fairieanum, 1', Oct., grn., wh., pur.
 haynaldianum, 2½', Jan., Mch., wh., ro., grn., pur.
 hirsutissimum, 1½', Mch., My., pur., grn.
 lawrenceanum, 1', Ap., My., wh., pur., grn., br.
 — hycanum, a rare albino.
 niveum, 6", spr., wh., faintly dotted ro.
 rothschildianum, 2', Mch., Ap., dull yel., pur. br., wh.
 Stonei, 2', My., Jy., cream, ro., pur.; canariatum, magnificum, and platytanum are distinct vars.
 superbiens, 9", aut., wh., grn., pur. br. (syn. veitchianum).
 venustum, 8", Oct., grn., red.

Principal Cool House Species and Varieties:—

- insigne, 1', win., grn., wh., pur. br. A most popular, useful, and easily grown species, now represented by many choice vars.
 — Chantinii, 1', wh., grn., vio. pur.
 — Maulei, 1', wh., grn., pur., very large.
 — Sanderæ, 10", prim. yel., rare and beautiful.
 — sanderianum, 10", palest yel., very rare.
 — violaceum punctatum, 1', grn., wh., vio. pur. spots.
 Schlimii, 10", ro. pk., car., wh. (with botanists, Selenipedium Schlimii).
 — albiflorum, wh., bluish.
 spicerianum, 8", aut., wh., grn., pur.
 villosum, 14", Dec. to Mch., grn., br., pur.
 — aureum, yel., grn., wh.

Principal Hardy Species:—

- Calceolus, 1½', sum., yel.
 californicum, 1½', Aug., Sep., yel., wh.
 guttatum, 8", My., wh., ro. pur.
 macranthum, 1', sum., pur.

Other Species:—

- acaule, 6", My., hdy., ro. pur.
 candidum, 1', Je., hdy., wh.
 caricinum, 1', Jy., grn., br., pur. (with botanists, Selenipedium caricinum).
 chamberlainianum, 1½', Ap., My., creamy wh., ro. pur., crim.
 ciliolare, 1', Ap., My., wh., grn., pur.
 Druryi, 1', Ap., Je., yel., bl., pur.
 Exul, 8", Ap., wh., yel., pur., grn.
 Hookeræ, 8", yel., grn., pur.
 japonicum, 1', spr., grn., wh., ro. pur.
 lævigatum (see philippinense).
 longifolium, 3', sum., yel., grn., wh. (with botanists, Selenipedium longifolium).
 Lowii, 1', sum., grn., pur.
 mastersianum, 1½', Ap., grn.
 Parishii, 2', sum., grn., straw colour.
 philippinense, 2', spr., wh., pur., grn. (syn. lævigatum).
 purpuratum, 8", win., wh., pur.
 Roezlii, 3', Mch., My., yel., grn., pur. (with botanists, Selenipedium Roezlii).
 sanderianum, 2', Sep., pur., dark pur., br.
 veitchianum (see superbiens).
 Victoriae-Marie, 1½', grn., wh., pur.

Principal Hybrids:—

- Annie Measures, Ap. (bellatulum × dayanum).
 arthurianum, Oct., Nov. (insigne × fairieanum).
 Aylingii, Je. (niveum × ciliolare).
 Baron Schröder, Nov. (œnanthum superbum × fairieanum).
 calurum, Sep., Oct. (longifolium × Sedenii).
 Calypso, Jan., Feb. (Boxallii × spicerianum).
 cardinale, Dec., Jan. (Sedenii × Schlimii albiflorum).
 Chapmanii magnificum, My. (bellatulum × Curtisii).
 Charles Richman, My., Je. (bellatulum × barbatum superbum).
 concolor-lawre, Feb. (concolor × lawrenceanum).
 dominianum, Je., Sep. (caricinum × caudatum).
 Edwardii, Jy. (superbiens × fairieanum).
 germinyanum, Feb., Mch. (hirsutissimum × villosum).
 Godefroyæ, Aug. (bellatulum × niveum).
 grande, My. (longifolium × caudatum).
 harrisianum, Feb., Oct. (villosum × barbatum).
 Hera Adrastus, Jan. (Boxallii × leeanum).
 Hermione (spicerianum × barbatum Warneri).
 I'Ansonii, Je. (rothschildianum × Morgania).
 J. H. Veitch, Aug. (Curtisii × Stonei platytanum).
 lathamianum, Feb. (spicerianum × villosum).
 Lawrebel, Ap., Je. (lawrenceanum × bellatulum).
 leeanum, Nov., Dec., Jan. (insigne × spicerianum). The most beautiful and useful of all hybrids.
 Lord Roberts, Dec. (Charlesworthii × Creon).
 Maynardii, Dec., Jan. (purpuratum × spicerianum).
 macrochilum, Aug. (longifolium × caudatum).
 Memoria Moensii, Oct. (spicerianum × œnanthum superbum).
 Morgania, Nov., Jan., Jy. (superbiens × Stonei) (see p. 269).
 Mrs. Reginald Young, Je. (sanderianum × Lowii).
 Niobe, Dec., Jan. (spicerianum × fairieanum).
 nitens, Nov., Jan. (insigne Maulei × villosum).
 œnanthum, Sep., Nov. (harrisianum × insigne Maulei).
 Olenus, Mch., Ap., My. (bellatulum × ciliolare).
 The Burford Lodge and Gertrude Hollington vars. are especially fine).
 orphanum, Aug. (barbatum × Druryi).
 pitcherianum, Oct. (spicerianum × harrisianum superbum).
 — Williams' var., very free flowering.
 Regina, Oct. (leeaanum superbum × fairieanum).
 sanderiano-superbiens, Aug. (superbiens × sanderianum).
 schofieldianum, Ap. (bellatulum × hirsutissimum).
 Schröderæ, Dec., Jan. (caudatum × Sedenii).
 Sedenii, Mch., Aug. (Schlimii × longifolium). An excellent var. is candidulum.
 selligerum, My., Je. (barbatum × philippinense).
 swanianum, Mch. (dayanum × barbatum).
 tessellatum porphyreum, Aug. (barbatum × concolor).
 Tityus, Nov. (spicerianum × œnanthum superbum).
 vexillarium, Jan. (barbatum × fairieanum).
 Vidor (Charles Canham × Harrisianum superbum) (see p. 271).
 Vipanii, My. (philippinense × niveum).
 William Lloyd, Dec. (bellatulum × swanianum).
 Winifred Hollington, Ap. (niveum × callosum).
 youngianum, Jy., Aug. (philippinense × superbiens).

CYRILLA.

Greenhouse evergreen shrubs (ord. Cyrillæ) of little value. They do in a mixture of sandy loam and peat. Increase is by cuttings in very sandy soil, or pure sand, under a bell-glass, in heat. Probably the two species mentioned below are geographical forms of one.

Principal Species:—

- antillana, 6', Jy., wh. racemiflora, 6', Je. to Aug., wh.

The Cyrilla of L'Héritier is a synonym of Achimenes.

CYRTANDRA.

A large genus (*ord.* Gesneraceæ) of stove shrubs and trees. They are of little value horticulturally, and few species have, so far, been introduced. They like a mixture of rough peat in bulk, with a little sphagnum, sand, and charcoal; also plenty of water when growing, and brisk heat; no water in winter. They may be reproduced by half-ripened cuttings, in heat, in spring.

Principal Species :—

bicolor, wh., pur. Pritchardii, wh., small.
pendula, wh., spotted pur.

CYRTANTHERA (*see* JACOBINIA).

CYRPIPODIUM VIDOR (*see* p. 270).

CYRTANTHUS.

Handsome South African bulbous plants (*ord.* Amaryllidæ), with pretty flowers, and of much value for flowering in the greenhouse, or for conservatory decoration. Propagation is by offsets. A rich, open loam suits. A greenhouse temperature in summer suits the greater number, but the majority ought to be kept in the stove in winter. After the leaves become yellow, keep them dry until spring, when the plants start into growth. Some, *e.g.* *carneus*, are evergreen, and must be carefully watered in winter.

Principal Species :—

collinus, 1', Aug., red (*syns.* *Monella glauca* and *M. collina*).
lutescens, 1', yel. (*syn.* *Monella ochroleuca*).
— Cooperi, yel. (*syn.* *lutescens*, Hooker).
Mackonii, 1', win., spr., wh.
obliquus, 2', Je., red (*syn.* *Crinum obliquum*).
odoratus, 9", Jy., crim. (*syn.* *Monella odora*).
sanguineus, 9", Aug., red (*syn.* *Gastronema sanguineum*).

Other Species and Varieties :—

angustifolius, 1', aut., red (*syns.* *Crinum angustifolium*, etc.).
— grandiflorus.
— striatus.
— ventricosus. red.
brachysephyphus, 9", Jy., carneus, 1½', red.
Galpini, 1', Aug., red.
helictus, 9", Sep., wh.
Huttonii, 1', My., pale red.
hybridus (*sanguineus* × *Vallota purpurea*), 1', or, sc.
Macowanii, 1', sc.
O'Brienii, 1', sc.
parviflorus, 1', Jan., sc.
rectiflorus, 1½', red.
smithianus, 6", My., wh., striped grn. or br.
spiralis, 1', Nov., sc. (*syn.* *Monella spiralis*).
Tuckii, 1½', Jy., red, yel. uniflorus, 9", win., wh. (*syn.* *Amaryllis clavata*).
vittatus, wh., striped br.

CYRTOCHILUM (*see* ONCIDIUM).**CYRTOMIUM.**

Now included under *Aspidium*, which *see*. Ex.: *C. falcatum* and *C. f. caryotideum*.

CYRTOPERA.

Greenhouse terrestrial Orchids (*ord.* Orchidaceæ), closely allied to *Cyrtopodium*, and sometimes placed under that genus. Propagation, by division before growth starts. Soil, good loam two-thirds, old Mushroom bed manure one-third, with sand. The plants love plenty of heat and moisture in the growing season, and less water and a lower temperature in the resting period, which coincides with our winter.

Principal Species :—

flava, 3', spikes 2', yel., dotted br. (*syn.* *Cyrtopodium flavum*).
flexuosa, wh., spotted pur.
papillosa, yel.
Regnierii, yel.
sanguinea, sum., pale pur., br., root tuberos (*syn.* *Cyrtopodium sanguineum*).
Woodfordii, yel., lip pur. (*syn.* *Cyrtopodium Woodfordii*).

CYRTOPODIUM.

A genus of about twenty species of stove terrestrial Orchids (*ord.* Orchidaceæ). They answer to the same treatment as *Cyrtopera*, which *see*.

Principal Species :—

Alicia, grn., br., wh.
Andersonii, spr., yel.
— cardiophilum, yel.
flavum (*see* *Cyrtopera flava*).
flavescens, yel., close to Andersonii.
punctatum, Ap., yel., spotted br.
— splendens, yel., br., red.
saintlegerianum, yel., blotched br.
sanguineum (*see* *Cyrtopera sanguinea*).
virescens, Dec., yel.

CYRTOSPERMA.

Stove perennial herbs (*ord.* Aroidæ), requiring the same treatment as that given to the *Alocasias*. The plants are not well known to gardeners, with the exception of *Johnstonii*.

Principal Species :—

ferox, spathe greenish wh.
Johnstonii, lvs. grn., veined ro. red. Of great size; a noble foliage plant (*syn.* *Alocasia Johnstonii*).
senegalense, lvs. 1'.

CYSTACANTHUS.

Stove herbaceous plants (*ord.* Acanthaceæ), requiring a light, sandy loam and peat in mixture. Cuttings of the young growths root readily in bottom heat in spring and early summer. They must be kept close, but watched, or they damp off.

Principal Species :—

turgidus, 1½', Ap. (*syn.* *Meninia turgida*). A pretty plant, with wh., ro. striped flowers.

Cyrtoceras (*see* *Hoya*).

Cyrtogonium (*see* *Acrostichum*).

CYSTOPTERIS. (THE BLADDER FERN.)

Elegant hardy Ferns (*ord.* Filices), with one exception (*bulbifera*) natives of Britain. Allied to *Microlepia* and *Woodsia*. They are choice subjects for the hardy fernery, where they delight in a light, rich soil, such as sandy loam, peat, and leaf mould in equal parts. When in pots, a little old mortar rubbish should be added to the soil. Propagation is by spores and division in all cases; by bulbils, in addition, in the case of *bulbifera*. Spores are best sown in autumn, and division of the crowns should be practised in March and April.

are by no means unornamental. The *Laburnum* was formerly included in this genus, but it is now placed in a genus with its allied species, such as *Adami*.

Propagation.—By seed, sown when ripe, in sandy soil in a cool frame, artificial heat not necessary; by layers; by grafting upon a common stock, such as the *Laburnum*, for the rarer species and those of prostrate habit; and by cuttings of the young shoots, taken in spring or autumn, with a heel, and struck in a close frame. The cuttings should be about 3" long. This is the method of propagation for the *Genistas*.



Photo: Cassell & Company, Ltd.

CYTISUS SCOPARIUS SULPHUREUS (see p. 273).

Principal Species:—

alpina, 4" to 9".
bulbifera, 6" to 15". May
 be propagated by the
 bulbils.
fragilis, 6" to 9". There
 are several forms of this

pretty native Fern, of
 which *angustata*, *den-*
tata, and *dickeana* are
 the best. The last named
 is especially distinct.
montana, 6" to 9", rare.

CYTISUS.

Description.—Handsome flowering shrubs (*ord.* Leguminosae), hardy for the most part, but in a few instances requiring the shelter of a greenhouse. There is a considerable variation in habit, some of the species making thick bushes 10' or 12' in height, as in the case of the common Broom; others being prostrate shrubs suitable for planting in the rock garden. In this latter section may be placed *Ardoinei*, *purpureus*, and the charming hybrid *kewensis*. *Canariensis* and *racemosus* are very popular window and conservatory plants, and as "*Genistas*" find their way in thousands into the market. *Albus* and *præcox* are grand plants for massing in clumps upon the lawn, for even when not in bloom their long, green, whip-like branches

Soil.—A good, sandy loam, with an admixture of leaf mould or peat, will suit the pot plants admirably. For those growing outdoors any ordinary soil will suit, provided it be not too heavy and lumpy.

Other Cultural Points.—The dwarf, bushy *Genistas*, in 5" and 6" pots, so much in request, are obtained by striking cuttings in close frames in spring, and growing the plants steadily on in cold frames through the early part of the summer. Pinching is resorted to several times, to induce a bushy habit, and towards the end of the summer the plants are placed out of doors on an ash bed to ripen. Firm potting is essential, and, once the pots are filled with roots, occasional supplies of liquid manure are given. In spring the plants are brought into heat in batches, so as to furnish a succession of bloom. Much heat must not be given, or the buds will drop. *Canariensis* is naturally a little later in blooming than *racemosus*. Old plants are cut back immediately after flowering, placed in gentle heat, and kept syringed. They soon break into fresh growth, and are then gradually

hardened off. Spider and thrips are the chief insect pests; they may be kept in check by timely fumigation.

Andréanus may be treated in similar fashion, except that harder pruning is necessary to counteract its very straggling habit. Less water should be given to this than to most of the other Cytisuses; very little indeed is needed during the winter. It does best if confined to small pots.

Standard Cytisuses, worked on clean 3' or 4' stocks of the Laburnum, make handsome shrubby plants.

Principal Species and Varieties :—

- albus, 6' to 10', spr., hdy., wh.
— multiflorus, an improved form.
Ardoini, 4' to 6', spr., hdy., yel., prostrate.
canariensis, 1' to 6', spr., sum., grh., yel.
filipes, 4' to 7', spr., grh., wh., sub-pendulous.
fragrans, 1' to 1', Ap., Je., grh., yel.
— elegans, a stronger plant.
hirsutus, Je., hdy., yel., prostrate; good for the rockery.
kewensis, My., hdy., creamy wh., prostrate; may be grafted on standards; hybrid.
precox, 3' to 6', My., hdy., cream yel. (hybrid, purgans × albus).
purpureus, My., hdy., pur., prostrate.
racemosus (of gardens), 1' to 1', Je., Jy., grh., yel. Originally described as a true species, now referred by botanists to fragrans. There are several subvars., of which everestianus is one of the best.
scoparius, 3' to 12', spr., sum., hdy., yel. Common Broom.
— andréanus, 2' to 6', spr., hdy., yel., rich chestnut br. A showy conservatory plant (*syn.* Genista andréana).
— sulphureus, yel. (*see* p. 272).

Other Species and Varieties :—

- Adami (*see* Laburnum Adami).
alpinus (*see* Laburnum alpinum).
anagyris (*see* Adenocarpus hispanicus).
andréanus (*see* scoparius andréanus).
austriacus, 2' to 4', Je., hdy., yel.
littoralis, 3', My., hdy., yel. (*syn.* supinus of gardens, not Jacquin).
candicans, 6' to 9', My., Jy., grh., yel. (*syn.* Genista candicans).
capitatus, 2' to 4', Je., hdy., yel.
decumbens, Je., Aug., yel. (*syn.* Genista prostrata).
glabrescens, My., hdy., yel.
Laburnum (*see* Laburnum vulgare).
linifolius, Jan., Je., grh., yel. (*syn.* Genista linifolia).
nigricans, 3' to 6', Je., hdy., yel. (*syn.* Lembotropis nigricans).
— Carlieri, persistent bloomer.
proliferus, 2' to 4', Ap., My., grh., wh.
purgans, 3' to 5', Je., Jy., grh., yel. (*syn.* Genista purgans).
schipkaensis, 1', wh.
sessilifolius, 4' to 6', My., hdy., yel.
supinus (of gardens, *see* biflorus).
Weldenii (*see* Petteria ramentacea).

DABOËCIA.

A small genus of hardy evergreen shrubs (*ord.* Ericacæ). They are dwarf growing, and thrive in peat in shady places. Propagation is by cuttings and layers.

Principal Species :—

- polifolia, 2', Jy., pur., a native of Ireland (*syn.* Menziesia polifolia).
— alba, similar to the type except for the wh. flowers.
There are several other forms varying little from the type.

Czackia (*see* Paradisea).

DACRYDIUM.

A genus (*ord.* Coniferae) of greenhouse Conifers, ranging in height from 15' to 100'. They flourish in a mixture of loam, peat, and sand, and may be propagated from cuttings of young wood in very sandy peat beneath a bell-glass. The chief economic value lies in the hardness of the wood of Franklini, which is valuable for spars. Taxoides yields a beverage resembling Spruce beer.

Principal Species :—

- araucaroides, 20'.
cupressinum, 20'.
elatum, 20'.
Franklini, 100'.

DACTYLIS.

A strong-growing, hardy perennial Grass (*ord.* Gramineæ), often known as the Rough Cocksfoot. Glomerata flowers in June and July, the spikes being 3' high. Propagation is by seeds and division. It thrives in damp places. There is a dwarfer form with variegated foliage, glomerata variegata, that is extensively used in summer bedding; it has a light, silvery appearance. As this is not so hardy as the wild form, some plants should always be wintered in cold frames.

DADDY LONG LEGS.

One of our commonest summer insects is the Crane Fly (*Tipula oleracea*), better known by its popular name of Daddy Long Legs. This huge, gnat-like insect, with six long, many-jointed legs, and pair of gauze wings, is the parent of that most vicious garden pest, the Leather Jacket grub. These grubs attack all the Cabbage family—Lettuces, Beans, Potatoes, etc.—consequently the insects should be destroyed whenever found, to prevent egg deposition. On grass or farm land heavy rolling keeps the pest in check, but in gardens trapping by means of sliced Carrots, Potatoes, or Parsnips (each with a skewer attached) buried just below the surface of the soil, is a good remedy, provided the traps are regularly inspected and the grubs killed. A weak solution of gas liquor, with lime added, is said to be a remedy; this is applied through a watering-pot. The Leather Jacket is occasionally confused with the wireworm. (*See* WIREWORM.)

DÆDALACANTHUS.

Four species of this genus (*ord.* Acanthaceæ) receive some attention from gardeners. They require stove treatment, and are effective when well grown. Propagation is by cuttings in very sandy soil under a bell-glass over bottom heat, early in the year; also by seeds. Soil, mellow loam, leaf mould, peat, and coarse sand.

Principal Species :—

- macrophyllus, 3', Jan., vio. bl. (*syn.* Eranthemum macrophyllum).
montanus, 2', Mch., lil. pur. (*syn.* Eranthemum montanum).
nervosus, 2', Dec., bl. (*syn.* Eranthemum pulchellum).
strictus, 2½', My., pur. (*syn.* Eranthemum strictum).

Dactylanthus (*see* Euphorbia).

Dactylicapnos (*see* Dicentra).

Dactylis caespitosa (*see* Poa flabellata).

Dactyloctenium (*see* Eleusine).

Dactylophyllum (of Benthams, *see* Gilia).

DÆMIA.

A genus (*ord.* Asclepiadææ) of evergreen twiners that grow well in the stove. They range in height from 3' to 10'. Propagation is by spring cuttings in sandy soil under a bell-glass over

tall pillars. All have spines on the leaf stalks, which enable them to climb up trees. *Draco* yields the best dragon's blood, so valuable in stains and varnishes. All are readily raised from seed sown in pans in heat. A stove temperature and moist atmosphere are at all times essential, and on every bright day copious syringings must be given to keep down insects and ensure clean growth. In pots or planted out, the compost of loam, peat, and leaf soil must be well drained.

Principal Species :—

Draco, fronds 6', blk. spines.
grandis.

Jenkinsianus, arching deep grn. fronds.

Lewisianus, wh. leaf stalks, blk. sheaths.

melanochætes, slender growth.

palembanicus, one of the best in a young state.

Other Species :—

calicarpus.

trichrous.

fissus.

intermedius.

Hystrix.

longipes.

periacanthus.

DAFFODIL.

Description.—The favourite English name for the greater number of the plants included under the genus *Narcissus* suggests a few remarks on these charming flowers from a more popular point of view than would be convenient under the heading of *Narcissus*, which may be referred to for a more systematic plan of treatment. The beauty of the Daffodil, a name which now embraces more than the trumpet *Narcissi* originally called Daffodils, is unquestioned, and the flower now forms a leading feature in every spring garden worthy of the name. In its various forms it can be brought into bloom from Christmas onwards under glass, and in the open ground its lovely flowers give our gardens much of their beauty in March, April, and May. As a cut flower it has no rivals in its season, and whether planted in grass, in borders, or on rock-work, it fills the most fastidious with pleasure. In pots it is of great value for the decoration of the greenhouse, conservatory, or window.

Propagation.—Daffodils are generally propagated by offsets, the only method for named or meritorious varieties. These are taken off when the plants are at rest. New varieties are raised from seeds, which can be sown as soon as ripe either in beds in the garden or in pots or boxes when ripe. Or they may be kept until spring and then sown in the same manner. Thin sowing is necessary, as it is best not to disturb the young bulbs until they are at least two years old. After the first season's growth, about $\frac{1}{2}$ " of fresh soil should be placed on the top of the beds or pots. Raising Daffodils from seed is strongly recommended to those who have time and space. By this means many improvements have been produced, although the percentage of superior flowers is not large. Much additional interest will accrue to the raiser if he adopt systematic cross-fertilisation, and keep a record of the crosses. Hybridisation between the



Photo: Cassell & Co., Ltd.

DAFFODIL MASTER AT ARMS (see p. 276).

bottom heat. Equal parts of fibrous loam and peat, with sand, suit them.

Principal Species :—

extensa, 3', Je., Jy., wh. *scandens*, 10', Je., Jy., wh.

DÆMONOROPS.

Although in the *Genera Plantarum* this genus of climbing Palms (*ord.* Palmæ) was united to the closely allied genus, *Calamus*, later authorities have again divided them. In a small state several species make useful table plants, while in a large stove they make handsome subjects for clothing

different sections will also give interesting results.

Soil.—The Daffodil likes a good, loamy soil, but dislikes coming into contact with fresh animal manure. When suitable, the land may be well manured, and a crop of Potatoes taken off before the Daffodils are planted; but where this is not convenient the land may have a dressing of about $7\frac{1}{2}$ oz. of basic slag to the square yard, as recommended by Mr. Barr, or his alternative, $1\frac{1}{2}$ oz. of crushed bones, although the latter is more risky on account of there being greater danger from fungoid diseases caused by the quality of the bones. Where animal manure must be used, it should be dug deeply into the soil well below the bulbs.

Planting.—The forms of the Poet's Daffodil all start into growth early, and ought, if possible, to be planted as soon as the leaves decay. This is not always possible, and they may be planted at a later season. The others may be planted from the beginning of September to the beginning of December, or even later in an emergency, although the earlier they can be committed to the soil the better. The proper depth depends upon the size of the bulbs, but from 2" to 3" deep will suit the greater number, although a better system is to place them about one and a half times the length of the bulb in the soil.

Lifting.—When the leaves are quite yellow the bulbs may be lifted if desired, but annual lifting is not necessary unless for trade purposes. Two years on poor and three on rich soils are good for ordinary practice. Daffodils in grass may remain for many years undisturbed.

Daffodils in Grass.—In planting Daffodils in grass a natural method of arrangement must be followed. Broad, irregular groups will look much better than a few bulbs together at uniform distances. As the soil below turf is often poor, make a fair sized hole with a trowel or large dibber, filling this with good soil before planting the bulbs. The leaves of Daffodils in grass must not be cut before they become yellow.

Daffodils in Pots.—Very suitable pots are $4\frac{1}{2}$ " and 6", and each will contain from three to six bulbs, according to size. Smaller varieties may be planted more closely. A good, free soil, with plenty of drainage, will suit, and if moderately moist the earth will not need watering before the pots are taken inside. After planting, the pots should be plunged outside, as in the case of other bulbs, taking them under glass when root growth

has been made, and bringing them on gradually. The slower the forcing the better the flowers. Daffodils do not take kindly to high temperatures.

Daffodils in the Rock Garden.—Many of the white and delicate Daffodils thrive as well in the rock garden as anywhere, and it is the most suitable position for the smaller species, such as



DAFFODIL MRS. J. B. M. CAMM (see p. 276).

cyclamineus or minimus. Cyclamineus likes a moist, peaty soil, and triandrus albus should be in crevices with gravel and sand.

Daffodils for Edgings.—Pretty spring edgings may be made with the miniature-flowered species: nanus, which is cheap, is as good as any. The bulbs should be planted behind some permanent edging, unless used as a margin for beds or borders on grass.

Selections of Varieties:—

As new forms are constantly appearing, and older ones go out of cultivation, the following selections are only given as a guide to small growers in obtaining a representative collection.

For Borders or Pots :—

Barrii conspicuus.
Emperor.
Empress.
Golden Spur.
Gwyther.
Horsefieldii.
John Bain.
Marchioness of Lorne.
Master at Arms (see p.
274).
Mrs. Backhouse.

Mrs. J. B. M. Camm (see
p. 275).
nanus.
Palmerston.
poeticus ornatus.
poeticus, double.
P. R. Barr.
Queen Bess.
Sir Watkin.
telamonius plenus.
W. P. Milner.

DAHLIA.

Description.—The Dahlia (*ord.* Compositæ) is one of those indispensable flowers which need no commendation, and which seem constantly to grow in favour. Annually improvements are being made in it, and the changes in form and advances in colour have done much to maintain its popularity. At present the Cactus Dahlias are the most admired, but the other sections have all merits of their own. The large, ball-shaped Show and Fancy flowers are very effective, if rather stiff-



Photo: Cassell & Company, Ltd.

DAHLIA MRS. J. J. CROWE, A BEAUTIFUL YELLOW CACTUS VARIETY (see p. 275).

For Naturalising in Grass :—

abscissus.
biflorus.
Burbidgei.
Butter and Eggs, double.
Cynosure.
Duchess of Brabant.
Golden Mary.
Golden Spur.
Henry Irving.
Johnstoni Queen of Spain.

moschatus.
obvallaris.
odorus rugulosus.
pallidus præcox.
poeticus.
— double.
princeps.
rugilobus.
telamonius plenus.

For Rock Gardens :—

Corbularia in variety.
cyclamineus.
juncifolius.
lobularis.
Macleaii.

minimus.
minor.
moschatus.
nanus.
triandrus albus.

looking, in the garden, and the little Pompons are much valued for their profusion of bloom, and for cutting. The parents of our modern Dahlias are believed to have been *coccinea*, *Merckii*, and *variabilis*. The Cactus Dahlias are descendants of *Yuarezii*.

Propagation.—Named varieties of Dahlias are generally propagated by cuttings produced from the tubers, which are placed in bottom heat from January onwards, under glass, to start them into growth. The tubers should just be covered with soil, but not the crowns, and when the growths have made two joints they are taken off below the lower one and rooted in heat in small pots filled with light soil, singly. They are then grown on

Dahlia (of Thunberg, see *Trichocladus*).

under glass, and finally hardened before being planted out. The tubers will produce cuttings for some time. The cuttings should be as sturdy as possible. The tubers may also be divided, but each part must have an eye attached. Dahlias are also easily raised from seeds sown in heat in early spring and pricked off into single pots when large enough. If grown on without a check, and planted out in June, they will flower that year. Cuttings of side shoots struck in pots in summer form "pot-roots" for another season.

Dahlia ought to have liberal supplies of water, and occasionally of liquid manure, although this may easily be overdone, with the effect of causing gross growth and fewer flowers. Thinning out is generally desirable when large blooms are wanted, but there is a considerable difference in the habit of plants, and their individual requirements in this respect must be studied. Flowers for exhibition must be protected from the weather and from strong sun, if they are to be kept back for shows. For this purpose some use hollow cardboard



Photo: Cassell & Company, Ltd.

DAHLIA STARFISH, SCARLET CACTUS VARIETY (see p. 278).

Soil.—For the cultivation of the Dahlia a rich, well-manured soil is necessary, but the manure ought not to be freshly applied to the soil, or gross growth will result. It is desirable that the beds should be deeply trenched and well manured the previous autumn. Light soils ought to be enriched by the addition of good loam.

Planting.—The end of May or the beginning of June is usually the best time to plant out Dahlias, but they should have careful attention at first, and protection, if necessary, from late frosts. The principal stakes should be placed in position before planting, and the stems secured to them with some soft tying material. The ground must be made firm about the plants, which may be placed from 5' to 6' apart.

Other Cultural Points.—When growing, the

cones or oiled canvas caps, and others apply pots. Each branch should be secured singly to the stakes.

Enemies.—The first enemy the grower has to contend with is usually the slug, which is very troublesome to young plants. Some fresh lime and soot round the plant will help to keep slugs away, but hand-picking at night should also be attended to. A more reliable precaution is to put a zinc ring with notched edges round the plants, sinking it in the ground so that the slugs cannot go underneath. The cuckoo-spit or frog-hopper (*Tettigonia spumaria*) is often troublesome at a later stage, and the froth-like substance should be taken off before the insect emerges. The greatest enemy, however, is the earwig, which is very injurious to buds and flowers. A flower pot placed on the top

of the stake, with a little dry hay or moss in it, and searched daily, will be the means of catching great numbers.

Lifting the Plants.—When frost has destroyed the foliage, cut down the plants to about 6" from the surface of the soil, and, after allowing them to remain for a few days, lift the tubers and dry them slightly before storing in a dry, frost-proof place during winter.

Classification.—Apart from the various species, a selection of which are named below, the Dahlias

Selections of Varieties :—

Cactus :—

Arachne.
Chas. Woodbridge.
Cornucopia.
Countess of Lonsdale.
Emperor.
Lord Roberts (see figure).
Loyalty.
Lucius.
Magnificent.
Major Weston.

Mayor Tuppenny.
Mrs. C. Gage.
Mrs. J. J. Crowe (see p. 276).
Red Rover.
Starfish (see p. 277).
Uncle Tom.
Up-to-date.
Wm. Jowett.
Wm. Treseder.
Zephyr.

Show :—

Arthur Rawlings.	Jas. Cocker.
Colonist.	John Walker.
Duchess of York.	J. T. West.
Duke of Fife.	Mrs. Gladstone.
Harry Keith.	Mrs. Langtry.
	R. T. Rawlings.
	Wm. Rawlings.

Fancy :—

Buffalo Bill.	Matthew Campbell.
Dandy.	Mrs. J. Downie.
Dorothy.	Mrs. Saunders.
Duchess of Albany.	Peacock.
Emin Pasha.	Rebecca.
Goldsmith.	Rev. J. B. M. Camm.

Pompon :—

Arthur West.	Nerissa.
Bacchus.	Rosebud.
Dr. Jim.	Snowflake.
Emily Hopper.	Sunny Day-break.
Ganymede.	Tommy Keith.
Mars.	
Nellie Bromhead.	

Single :—

Alice Seale.	Naomie Tighe.
Beauty's Eye.	Northern Star.
Demon.	Polly Eccles.
Folly.	Phyllis.
Jeannette.	Victoria.
Miss Roberts.	W. C. Harvey.

Species :—

arborea, 12', Oct., wh.	
coccinea, 3', Oct., sc.	
excelsa, 30', Sep., pur.	
gracilis, 4', Oct., various.	
imperialis, 12', Oct., grh.	scapigera, 2', Je., wh.
when in bloom, wh., ro.	variabilis, 3', Sep., various.
Merckii, 4', Oct., yel.	Yuarezii, 5', Oct., sc.
wh., lil.	(syn. Juarezii).

DAIS.

This genus (*ord.* Thymelæaceæ) comprises several species. The best is *cotonifolia*, a greenhouse evergreen shrub that delights in peat and loam. It may be increased by root or stem cuttings in spring. The plant grows 10' high, and produces pink flowers in summer. *Sericea* is referred to *Lasiosiphon anthylloides*.

DAISY.

The garden Daisies are forms of *Bellis perennis*, which *see*. There are a number of forms of much beauty, and with perfectly double flowers. They are largely used for spring bedding, either in beds by themselves, or associated with other plants, in lines. They also make pretty edgings where they are not likely to be trodden upon. The double Daisies are increased by division, which is best done when they stop flowering. They ought to be replanted every year if possible.



Photo: Cassell & Company, Ltd.

DAHLIA LORD ROBERTS, WHITE CACTUS VARIETY.

in cultivation are known by the following classification. In addition to these recognised classes, Anemone-flowered and other forms have been introduced lately.

Show Dahlias.—Large, globular flowers, almost entirely of one colour, or with the ground colours lighter than the tips.

Fancy Dahlias.—Similar flowers, but striped or flaked with a variety of colours or markings; or with a yellow or scarlet ground with white tips.

Pompons.—Of similar form to the above, but of small size. There are a few Cactus Pompons.

Single flowers need no description.

Decorative Dahlias.—A useful class, which comprises flowers not belonging well to any other. To this have been relegated several of the old Cactus Dahlias not now considered of the true Cactus type.

Cactus Dahlias.—Charming flowers with narrow, pointed florets. There are a few single forms, liked by some for cutting.

DALBERGIA.

These trees (*ord.* Leguminosæ) require stove treatment. There are many species, most of which have white flowers. They have no decorative value. They are propagated from cuttings in spring under a bell-glass over bottom heat, and grow in fibrous loam, peat, and sharp sand.

Principal Species :—

latifolia, 30', sum., wh. *Sissoo*, 30', sum., wh.

DALEA.

A very large genus (*ord.* Leguminosæ) but little represented in gardens. The plants thrive in loam, peat, and plenty of coarse sand. With one exception, they are shrubby perennials. They are propagated by cuttings in March, in sand, under a bell-glass.

Principal Species :—

alopecuroides, 2', sum., *mutabilis*, 1½', Oct., wh.,
hdy. ann., bl. pur.
 Mutisii, 1½', Jy., pur.

DALECHAMPIA.

Stove evergreen climbers (*ord.* Euphorbiacæ). Propagation is by spring cuttings in sandy soil, beneath a bell-glass. They do best in equal parts of peat and loam, with some sand. The principal species is *roeziana*, which has yellow and rose blooms. All the others produce greenish white flowers; they grow from 6' to 12' high.

DAMASONIUM.

A small genus of aquatics (*ord.* Alismacæ) known chiefly by its British species. Under cultivation it should be treated like the Alismas, or Water Plantains.

Principal Species :—

stellatum, 1½', sum., wh., yel. (*syns.* *Alisma*
Damasonium and *Actinocarpus* *Damasonium*).

DAMNACANTHUS.

These intermediate house shrubs (*ord.* Rubiaceæ) have strong, opposite spines. They may be increased by cuttings in very sandy soil beneath a bell-glass, over bottom heat, and grown in rich, mellow loam, peat, and sand.

Principal Species :—

indicus, spr., grh. or hdy. ev. shr., wh.

DAMPIERA.

A genus of blue flowering herbs or shrubs (*ord.* Goodenovieæ) that thrive in a minimum winter temperature of 38° and a minimum summer heat of 55°. Propagation is by division or cuttings, and the plants grow well in peat and loam with sand. There are from six to twelve species, all from Australia, and all ranging from 6" to 12" high; they mostly flower in May.

Principal Species :—

Brownii, 1½', Jy., bl.

Dalea (cf. *Gartner*, see *Microdon*).

Dalibarda (see *Rubus*).

Dalmatian Cap (see *Tulipa*).

Dalrymplea (see *Turpinia*).

Damask Rose (see *Roses*).

Damask Violet (see *Hesperis*).

Damasonium (cf. *Schreber*, see *Ottelia*).

Dame's Rocket (see *Hesperis*).

Dammara (see *Agathis*).

DAMPING OFF.

Gardeners, amateur and professional, fully understand the condition of plant life known as "damping off." That this state is the result of the working of a minute fungus is not generally known, but it is a fact that excessive moisture in soil and atmosphere presents a condition which the fungus takes advantage of and so is able to destroy tender seedlings, young cuttings, succulent plants, etc. Ample drainage, a porous compost, and careful watering are necessary to prevent damping; and in the case of tender seedlings and cuttings it is advisable to surface the soil with fine sand; this prevents excessive moisture standing around the "neck," or "collar," of a plant, which is the point most liable to attack.

DAMSON.

Description.—The Damson is an improved form of the Bullace, *Prunus insititia* (*ord.* Rosacæ), and is highly valued. It is exceedingly useful to plant on the margins of orchards as a wind-break to protect more tender trees. It is usually grown in the form of standards and half-standards, and after the foundation has been properly laid practically no pruning is required.

Propagation.—By grafting, budding, seeds, and suckers, the latter method being invariably adopted for the popular variety *Farleigh Prolific*. Instructions for the two first named processes will be found under their respective heads.

Soil.—Any fertile, well-drained soil that contains lime is suitable.

Principal Varieties :—

Bradley's King, large, pur., dense bloom; flesh thick and well flavoured; ripe end of Sep.; a heavy cropper.

Crittenden, or *Farleigh Prolific*. Fruit medium, blk. with a bl. bloom; flesh juicy and sweet; ripe end of Sep.; very prolific.

Prune. The *Cheshire* or *Shropshire Prune* is large, oval, blk. with a bl. bloom; flesh yellowish grn. and of good flavour; ripe middle of Sep. The *Hereford Prune* is a longer oval, and the *Worcester Prune* is oval; both are excellent varieties.

Rivers' Early. Valued for its earliness, as it is ripe by the middle of Aug.; it is of fine quality. This var. was raised from *St. Etienne Plum* by the late Mr. Francis Rivers.

DANDELION.

Its thickened root and closely packed rosette of broad leaves make Dandelion the despair of those who desire beautiful lawns, for it kills the choicer Grasses by starving them, and "spudding" is the only good remedy. If, however, it is not a success in the flower garden it has some value in the kitchen garden, where it is sometimes cultivated for the sake of its bitter leaves, these taking the place of Endive in salads. The wild form is useful for this purpose, but the French form is better. Dandelion roots have some medicinal value as a diuretic, and sometimes when dried and ground they are used as a substitute for Chicory, with coffee.

DAPHNE.

Description.—Highly ornamental and sweet-scented shrubs (*ord.* Thymelæacæ), prized in the garden, shrubbery, rock garden, or conservatory. Some make pretty pot plants, and the well-known *D. Mezereum*, the *Mezereon* or *Spurge Olive*, is valued for its early, profuse blooming habit.

Daucida (see *Darcia*).

Propagation.—By cuttings, layers, or grafting; also by seeds. For cuttings, select ripened wood in autumn, insert the slips in peaty soil, and cover with a bell-glass, placing in a cool greenhouse until spring, when they may be placed in a little heat. The prostrate, hardy species are readily increased by layers, with or without making a cut beneath the layered branch, if kept down by a stone or peg. Raising plants from seeds is slow.

Soil.—The Mezereon does best in loam, the others in sandy peat; but Cneorum has been known to do well in heavy loam also.

Other Cultural Points.—To retain blagayana, and Cneorum in vigour, they ought to be gone over annually, and the branches pressed close to

Championi, 3', Feb., lil.
Genkwa, 3', Ap., ev., lil.
(*syn.* Fortunei).

glomerata, 1', ev., pur.
Gnidium, 2', Je., ev., pk.
japonica (*see* odora).

jezoënsis, 2', yel.
Laureola, Spurge Laurel,

3', Jan., ev., grn., yel.
oleoides, 2', Ap., ev., wh.

(*syns.* collina var. napolitana, and fioniana).
— elegantissima.

pontica, 5', Ap., ev., grn., yel.

— variegata.

sericea, 2', Ap., ev., wh.
(*syn.* collina of *Botanical Magazine*, t. 428).

striata, 2', Je., ev., pur.

DARLINGTONIA.

A half-hardy perennial (*ord.* Sarraceniaceæ), propagated by division in spring. It thrives out of doors in very favoured localities, but is best grown in a pit, where it will be safe from frost in



DARLINGTONIA CALIFORNICA.

the soil and kept down by large sized stones. Careful watering is necessary for plants grown under glass. The cutting of many of the flowers should be avoided in the case of odora; otherwise the plants become straggling.

Principal Species and Varieties:—

blagayana, 1', Ap., wh.	including forms with wh. flowers and one which blooms in aut.
A beautiful ev. trailing shr., with fragrant flowers.	
Cneorum, 1', Ap., pk.	odora, 3', Meh., grh. ev., pur.; sweet. A favourite, needing good drainage when in pots (<i>syn.</i> indica var. odora).
A charming ev. trailer. There are several forms.	
indica (<i>see</i> odora).	
Mezereum, 4', Feb., red.	— Mazellii, wh., pk.; blooms in win.; sweet.
There are several vars.,	

Other Species and Varieties:—

alpina, 2', My., ev., wh.	altaica, 2', Ap., wh.
(<i>syn.</i> candida).	caucasica, 1', My., wh.

Daphnitis (*see* Botryceras).

winter, and can be afforded a humid temperature in summer. A mixture of fibrous peat and chopped sphagnum is excellent.

Only Species:—

californica, 1½' Ap., grn., yel.

DARWINIA.

A small genus (*ord.* Myrtaceæ) of evergreen trees and shrubs that grow well in the greenhouse. Cuttings of young growths root readily in very sandy soil under a bell-glass. Equal parts of fibrous peat and loam, with sharp sand, suit.

Principal Species:—

fascicularis, 24', Je., red.	macrostegia, 21', My., crim. (<i>syn.</i> Genetyllis tulipifera).
fimbriata, 5', Je., ro.	
(<i>syn.</i> Genetyllis fimbriata).	taxifolia, 24', Je., wh.

Darea (*see* Asplenium).

Darnel (*see* Lolium).

Dasistoma (*see* Gerardia).

DASYLIRION.

Elegant greenhouse evergreens (*ord.* Liliaceæ) that may be raised from seeds, and thrive best in rich mellow loam and mortar rubble, with free drainage.

Principal Species :—

acrotrichum, 8', wh. (*syns.* *D. gracile*, Bonapartea gracilis, and Barbacenia gracilis).

Other Species :—

glaucophyllum, 12', wh. Beaucarnea Hook-
(*syn.* glaucum). eri).
Hookeri, 3', pur. (*syns.* longifolium (see Nolina
D. hartwegianum and longifolia).

DATISCA.

A hardy herbaceous perennial (*ord.* Datisceæ) that will grow in any fertile soil, and may be increased by division. Cannabina produces greenish yellow flowers in summer; height 6'.

DATURA.

Description.—Ornamental shrubs or trees and annuals (*ord.* Solanaceæ), those of shrubby or tree-like habit being the most valuable for garden purposes. They have handsome flowers and generally curious fruit. The shrubby Daturas, generally known as Brugmansias, are pretty on pillars or in bush form in large greenhouses or conservatories; the annuals are effective in borders, and a few of the others, such as suaveolens, may be placed out in summer for effect.

Propagation.—The shrubby species by cuttings or shoots about 6" or 8" long, the latter removed with a heel, and struck in sand and loam in a bottom heat of not less than 60°. The annuals by seeds sown in a hotbed or warm house and grown in pots until ready to plant out.

Soil.—A rather sandy soil suits them best, but they must have liquid manure occasionally to keep them growing in summer.

Other Cultural Points.—The shrubby section require a good growing heat in summer, but may be kept cool and rather on the dry side in winter. Prune after flowering.

Principal Species and Varieties :—

arborea, 10', Aug., grh. shr.; handsome.
chloanthia, 10', My., grh. shr., yel.
— flore pleno, double, fine.
cornigera, 10', Jy., grh. shr., wh.
— flore pleno, ornamental.
fastuosa, 2', Jy., ann.,
bl., wh.
— flore pleno, double.
— rubra, red.
Metel, 2', Je., ann., wh.
sanguinea, 10', Aug., grh.
tree, sc.; there is a yel.
form (*syn.* bicolor).
suaveolens, 12', Aug.,
grh. shr., wh.; hand-
some and fragrant (*syn.*
Knightii).

Other Species and Varieties :—

ceratocaula, 3', Jy., ann.,
wh.
ferox, 2', Aug., ann., wh.
meteloides, 2', Je., grh.
shr., vio. wh. (*syn.*
Wrightii).
quercifolia, 2', Jy., ann., vio.
Stramonium, Thorn
Apple, 2', Jy., ann., wh.
— flava, pale yel.
Tatula, lil. Gigantea is
a var.
Wrightii (see meteloides).

Dasytemon (of de Candolle, see *Crassula*).

Dasystephana (see *Gerardia*).

Date Palm (see *Phoenix dactylifera*).

Date Palm, Prickly (see *Acanthophanix*).

Date Plum (see *Diospyros Kaki*).

Date, Wild (see *Phoenix sylvestris*).

DAUBENYA.

Pretty little frame or greenhouse bulbs (*ord.* Liliaceæ), which grow in light soil and are propagated by offsets. After their leaves ripen they should be kept dry until they begin growth again.

Principal Species :—

aurea, 3', Je., yel. fulva, 6', Je., dull yel.

DAUCUS.

A small genus of hardy annual or biennial plants that are of little value, with the exception of Carota, a British species from which the Carrot has been evolved. (See CARROT.)

DAVALLIA.

Description.—A large and important genus of Ferns (*ord.* Filices), chiefly natives of the Tropics,



DATURA SUAVEOLENS.

and thus for the most part needing a stove temperature. Over a hundred species of Davallias have been described in the *Synopsis Filicum*, and several small genera, such as Acrophorus, Humata, Leucostegia, Loxoscaphe, Microlepis, Adontoloma, Prosaptia, Scyphularia, and Stenoloma, have now been merged in this one genus.

Propagation.—By spores in all cases, and by division of the creeping rhizomes in the case of large plants—the popular canariensis may be easily increased in this way. Some care is necessary to fix the rhizomes to the new compost. They should not be buried, but the soil should be made firm, and the rhizomes fastened down by small pegs of either wood or copper wire.

Soil.—Equal parts of fibrous loam and leaf soil, with sand. A little live sphagnum is a good

Daubentonia (see *Sesbania*).

addition in the case of basket plants. *Tenuifolia* must have all peat and sand, no loam.

Other Cultural Points.—*Davallias* are thirsty Ferns, and must never be allowed to get dry. At the same time, they are impatient of cold, waterlogged soil about their roots, and therefore small pots are advisable. For those species which have prominent, creeping rhizomes, such as *fijiensis*,



DAVALLIA CANARIENSIS.

bullata, and *canariensis*, shallow pans are the best receptacles, as they afford the greatest amount of surface room, with not too much useless soil. *Hirta*, and its variety *cristata*, do best in pots, as they are stronger rooters. Drainage must in all cases be ample.

Davallias in Baskets.—Many *Davallias* are suitable for culture in baskets, and *assamica*, *bullata*, *b. Mariesii*, *b. M. cristata*, *canariensis*, *hirta cristata*, *immersa*, *marginalis*, *retusa*, and *parvula* may be mentioned. Such baskets should, if possible, be dipped in the tank every day in summer. *Heterophylla* and *angustata* do well if grown upon tree trunks. No soil is necessary.

Fern Balls.—*Davallia bullata Mariesii* is largely imported from Japan, in the shape of Fern balls, rafts, and more or less perfect representations of birds, crocodiles, etc. It is a deciduous species, and lends itself well to this treatment. The rhizomes are allowed to dry until they can be bent without breaking, and then they are built into the desired shapes, with sphagnum as packing. The rhizomes start into growth readily with heat and moisture, and pretty decorative objects are thus obtained with little trouble. An occasional dip into weak liquid cow manure is beneficial.

Temperatures and Insects.—Temperature for the stove species, 60° minimum; from 65° to 70° is a good minimum summer temperature. *Canariensis* will do in a house whose temperature does not fall below 40°; it also thrives in an ordinary dwelling-room window. Thrips and snowy fly are the most troublesome insects, but the sponge and the vaporiser will keep them at bay. Fumigations should be light, and may, if necessary, be frequent.

Principal Species and Varieties :—

- | | |
|----------------------------------------------|----------------------------------------------|
| <i>affinis</i> , 1' to 2', st. | <i>platyphylla</i> , 3' to 4', grh. |
| <i>canariensis</i> , Hare's Foot | (<i>syn. lonchitidea</i>). |
| Fern, 1' to 1½', rhizomes | <i>repens</i> , 8" to 18", st. (<i>syn.</i> |
| creeping, grh. | <i>hemiptera</i> and <i>Odonto-</i> |
| <i>dissecta</i> , 1' to 1½', st. | <i>loma repens</i>). |
| <i>elegans</i> , 1' to 2', st.; <i>elata</i> | <i>solida</i> , 1' to 2', st. (<i>syn.</i> |
| and <i>polydactyla</i> are | <i>lucida</i>). The form |
| vars. | <i>ornata</i> has broader |
| <i>fijiensis</i> , 1' to 1½', st. | segments. |
| — <i>elegans</i> , very finely cut, | <i>Spelunca</i> , 3' to 5', light |
| light grh. | grh., very thin, st. |
| — <i>major</i> , a robust grower. | (<i>syn. D. polypodioides</i> , |
| — <i>plumosa</i> , 1' to 2', finely | <i>D. trichosticha</i> , and |
| cut, very elegant. | <i>Microlepia tricho-</i> |
| <i>hirta</i> , 3' to 5', st. (<i>syn.</i> | <i>sticha</i>). |
| <i>scaberula</i> and <i>Micro-</i> | <i>tenuifolia</i> , 1' to 1½', st. |
| <i>lepia hirta</i>). | <i>Burkei</i> , stricta, and |
| — <i>cristata</i> , 1½' to 3', st., | <i>Veitchii</i> are handsome |
| tasselled (<i>syn. Micro-</i> | vars. |
| <i>lepia hirta cristata</i>), an | <i>Tyermanni</i> , 2" to 4", |
| elegant basket Fern. | warm grh., good for |
| <i>pallida</i> , 2' to 3', st. (<i>syn.</i> | cutting. |
| <i>mooreana</i>). | <i>trichomanoides</i> , 6" to 9", |
| <i>pentaphylla</i> , st. (<i>syn.</i> | st. |
| <i>pycnocarpa</i>). | |



DAVALLIA CILIATA (see p. 283).

Other Species and Varieties:—

- aculeata, 4' to 6', st. (*syn.* *Stenoloma aculeata*).
 assamica, 6' to 12', warm grh. An elegant basket Fern, but very rare (*syn.* *Acrophorus assanicus* and *Leucostegia assamica*).
 alata (*see* *Emersonii*).
 alpina, 2' to 3', st.
 angustata, 3' to 8', st.
 bullata, 8' to 12', st.
 — *Mariesii*, 6' to 9', grh.
 calvescens (*see* *marginalis*).
 charophylla, 9' to 15'.
 ciliata, 1' to 1½', st. (*syn.* *Microlepia ciliata*) (*see* p. 232).
 cristata (*see* *strigosa*).
 divaricata, 1' to 2', st. (*syn.* *polyantha*).
 elata (a var. of *elegans*).
 Emersonii, 6' to 12', st. (*syn.* *alata*).
 foeniculacea, 9' to 18', st.
 firma (*see* *hirta*).
 fumaroides, 1' to 2', st.
 gibberosa, 1' to 1½', st.; *brachycarpa* is a var.
 griffithiana, 9' to 12', st.
 hemiptera (*see* *repens*).
 heterophylla, 3' to 6', st.
 hirsuta, 6' to 9', st. (*syn.* *Microlepia hirsuta*).
 immersa, 1' to 1½', st.
 Lorrainci, 6' to 12', st.
 lucida (*see* *solida*).
 louchitidea (*see* *platyphylla*).
 marginalis, 1½' to 2', st. (*syn.* *calvescens*, *scabra*, and *villosa*).
 membranulosa, 6' to 9', grh. (*syn.* *Leucostegia membranulosa*).
 mooreana (*see* *pallida*).
 multidentata, 2' to 3', warm grh. (*syn.* *Leucostegia multidentata*).
 Nova-Zealandia, 1' to 1½', grh. (*syn.* *Acrophorus hispidus*).
 parvula, 1' to 1½', st.
 pectinata, 4' to 8', st.
 pedata, 2' to 4', st.
 pinnata, 9' to 15', st.; serrata, gracilis, and luzonica are all very close to this species.
 polyantha (*see* *divaricata*).
 polypodioides (*see* *Spelunceae*).
 pycnocarpa (*see* *penta-phylla*).
 pyxidata, 9' to 18', st.
 retusa (*see* *Lindsaya retusa*).
 scaberula (*see* *hirta*).
 scabra (*see* *marginalis*).
 strigosa, 1' to 3', grh. (*syn.* *khasyana*); *rhomboidea* is a var.
 trichosticha (*see* *Spelunceae*).
 vestita, st.
 villosa (*see* *marginalis*).

DAVIDSONIA.

The only species of this Australian genus (*ord.* Saxifragæ) is an attractive stove plant, the young leaves of which are bright red. It thrives in a mixture of peat, loam, and sand, and may be increased by stem cuttings in sand under a bell-glass over bottom heat.

Only Species:—

pruriens, 3', lvs. red to deep grn. (*pungens* is a var.).

DAVIESIA.

A genus (*ord.* Leguminosæ) of evergreen shrubs that grow best in the greenhouse. Propagation is by cuttings of very firm wood in sandy soil beneath a bell-glass; or by seeds sown in heat when procurable. A compost of loam and peat suits.

Principal Species:—

alata, 3', Je., yel. ulicina, 2½', Je., yel.
 cordata, 3', Je., yel.

Other Species:—

corymbosa, 2', Jy., red, longifolia, 1½', My., yel.
 wh. squarrosa, 2', Je., yel.
 latifolia, 3', Je., yel.

DAY LILY (*see* *HEMEROCALLIS*).**DEATH'S HEAD HAWK MOTH.**

In England this large, night-flying moth (*Sphinx atropos*, or *Manduca atropos*) is much more common than it used to be. It can never be mistaken, owing to the skull-like marking on the thorax.

Dead Nettle (*see* *Lamium*).

Deal, red or yellow (*see* *Pinus sylvestris*).

Deal, White (*see* *Picea excelsa*).

Death's Herb (*see* *Atropa Belladonna*).

Debraa (*see* *Erisma*).

The larvæ feed on the Potato, but are sometimes found on Buckthorn and other plants; a larva when full grown will be 5" long, yellow, marked with purple. When full-fed it burrows 8" or 10" below the surface soil and turns into a reddish brown pupa; in this state it is often exposed during winter digging, and should then be killed. The moth appears in spring or early summer, and is one of the few species having power to emit a sound.

DECABELONE.

A genus (*ord.* Asclepiadæ) of succulent plants that thrive in the greenhouse in a mixture of loam and brick rubbish, with frequent applications of liquid manure when in active growth. Propagation is by cuttings, the base being dried before insertion in sand.

Principal Species:—

Barklyi, 6'', yel., spotted red.



DAVALLIA PARVULA.

DECAISNEA.

The best known species of this genus (*ord.* Berberidæ) is an upright Himalayan shrub that should be accommodated in the greenhouse. Propagation is by seeds, when procurable, and by cuttings. Soil, mellow loam with sharp sand.

Only Cultivated Species:—

insignis, 8', My., yel- Fargesii, close to insignis, lowish.

DECUMARIA.

Pretty twining plants (*ord.* Saxifragæ), propagated by cuttings in summer under a shaded hand-light. They grow in dry, rich soil in a warm position where they have a trellis or bush to twine over. There are several forms of the unnamed.

Only Species:—

barbara, 5', Je., wh.

Decaisnea (of Brongniart, *see* *Prescottia*).

Decaisnea (of Lindley, *see* *Tropidia*).

Decaspermum (*see* *Nelitis* and *Eugenia*).

Decaspora (*see* *Trochocarpa*).

Deciduous (*see* *Glossary*).

Deckeria (*see* *Triarteia*).

Decodon (*see* *Nesaea*).

Decostea (*see* *Griselinia*).

DEHERAINIA.

The only member of the genus (*ord.* Myrsineæ) is a stove shrub. It thrives in a mixture of loam, fibrous peat, and coarse sand, and is increased by cuttings of ripe wood in sand, under a bell-glass over bottom heat; also by seeds.

Only Species :—

smaragdina, 3', grn.; thick and fleshy.

DELARBREA.

The only cultivated species, *spectabilis* (*ord.* Araliaceæ) is an evergreen stove plant closely allied to the Aralias. It is a handsome plant, and if allowed will assume tree-like proportions. It succeeds if treated like a warm Aralia.



DENDROBIUM ATROVIOLEACEUM (see p. 237).

DELOSTOMA.

A stove tree (*ord.* Bignoniaceæ). Propagation is by cuttings in sand, or very sandy soil, beneath a bell-glass over bottom heat. A compost of mellow loam, with some peat and sand, suits it.

Principal Species :—

dentatum, aut., whitish bl.

DELPHINIUM. (LARKSPUR.)

Description.—The Delphiniums, or Larkspurs (*ord.* Ranunculaceæ), rank among the best and most effective of our summer flowers. The noble hybrid perennial Delphiniums are of surpassing effect when well grown; the various species of perennial habit are often beautiful, and the annuals are of much value for the garden or for cutting.

Propagation.—The perennials by seeds sown in spring, or by division at that season; the annuals by seeds sown as directed for annuals (half-hardy), afterwards planting them out where they are to bloom.

Delabechia (see *Sterculia*).

Delairia scandens (see *Senecio milkanioides*).

Soil.—A rich, well-manured soil is required to bring the Delphinium to perfection, and in dry weather copious waterings of liquid manure may be applied if tall plants are wished.

Other Cultural Points.—The perennials should be protected from slugs, and ought to be staked early, the stems being fastened as they grow. If the flower spikes are removed early, the side shoots will come into bloom in autumn.

Principal Species :—

Ajacia, 1½', sum., bl. Ann. Rocket Larkspur, several vars.

cardinale, 3', Aug., sc. A handsome per., but not a long liver.

cashmirianum, 1½', bl. A pretty, dwarf per.

Consolida, 2', sum., bl. The branching ann. Larkspur, several vars.

grandiflorum, 2', Je., bl. A fine plant, though inferior to the new hybrids named below. Several forms, such as *flore pleno*, *album*, *a. flore pleno*, and *pallidum*.

nudicaule, 1½', Jy., or. sc. A beautiful little plant.

— *aurantiacum*, differs slightly in colour.

Zalil, 2', Jy., yel. Best treated as a bien.; pretty and distinct (*syn.* *hybridum sulphureum*).

Hybrid Varieties :—

These are undoubtedly the finest, and many are of wonderful beauty. The recent introduction of white or whitish varieties will add much to their value. Those who wish to purchase are recommended to study the catalogues of nurserymen, as new varieties are introduced yearly. Those named are all good.

New and Expensive Varieties :—

Beauty of Lang-	King of Delphin-	Seneca.
port.	iums.	Sir Geo. Newnes.
Captain Holford.	Mrs. Rushton.	Sir John Forrest.
Dorothy Kelway.	Persimmon.	Sir Walter Scott.
Dr. Mead.	Portia.	The Queen.
Flying Fox.	Princess of Wales.	True Blue.
Imperial Majesty.	Sara.	

Cheaper, Recently Introduced Varieties of First-class Quality :—

Aziyade.	Kenneth.	Puck.
Belladonna.	Messent.	Salamander.
Bleu Celeste.	M. Porion.	Spinoza.
Brightness.	Mrs. Jas. Helme.	Toledo.
Frank Holl.	Nirvana.	Tour Eiffel.
John Bright.	Prince of Naples.	Ustane.

Other Species :—

<i>amcenum</i> , 2', Jy., pale bl.	<i>Menziesii</i> , 2', Jy., bl. (<i>syn.</i>
<i>azureum</i> , 3', Jy., bl.	<i>Nuttallii</i>).
<i>brunonianum</i> , 2', Je., pur.	<i>mesoleucum</i> , 3', Jy., bl.
bl.	<i>montanum</i> , 4', Jy., bl.
<i>cheilanthum</i> , 2', My., bl.	— <i>bracteosum</i> , 7'.
<i>corymbosum</i> , 1½', Jy., bl.	<i>oliverianum</i> , 1½', Je., bl.
<i>crassicaule</i> , Je., bl.	<i>palmatifidum</i> , 3', Jy., bl.
<i>decorum</i> , 1½', Je., bl.	— <i>glabellum</i> .
<i>denudatum</i> , 1½', Je., bl.	<i>peregrinum</i> , 1', Jy., bl.
<i>discolor</i> , 6', Aug., bl. wh.	<i>pubescens</i> , 2', Aug., bl.
<i>dyctiocarpum</i> , 4', Jy., bl.	<i>Pylzowi</i> , 1', Jy., bl.
<i>elatum</i> , 6', Jy., bl., several	<i>Requienii</i> , 4', Jy., bl.
vars.	<i>revolutum</i> , 6', Ap., bl.
<i>elegans</i> , 1½', Jy., bl.	<i>speciosum</i> , 4', Jy., bl.
— <i>flore pleno</i> .	<i>Staphisagria</i> , 2', Jy., pale bl.
<i>exaltatum</i> , 6', Jy., bl.	<i>szowitsianum</i> , 3', yel.
<i>halteratum</i> , 1', Je., ann.,	<i>tenuissimum</i> , 1', Aug., pur.
bl. (<i>syn.</i> <i>cardiopetalum</i>).	<i>tricornis</i> , 1', Jy., bl.
<i>laxiflorum</i> , 4', Jy., bl.	<i>triste</i> , 2', Jy., bl.
<i>maackianum</i> , 5', bl.	<i>troilifolium</i> , 3', Jy., bl.

Demetria (see *Grindelia*).

Demidovia (see *Tetragonia*).

DENDROBIUM.

Description. This very large genus (*ord.* Orchidaceæ) is confined entirely to the Old World, and forms, under cultivation in our stoves, one of the most generally useful groups of plants we have. All are epiphytes. The growths may be slender, as in *Lowii* or *luteolum*; tall and stout, as in *pulchellum* and *fimbriatum*; club-shaped, as in *thyrsoflorum*; hairy, as in *formosum giganteum*; pseudo-bulbous, as in *aggregatum*; or rounded and flattened, as in *linguiforme*. Some are quite deciduous, and others are perfectly evergreen, the former usually having thin leaves as compared

Hybridisation.—This genus is almost as popular with the hybridiser as is *Cypripedium*. Artificial fertilisation is easily managed, but the stigmatic surface must not be unduly irritated, or the ovary may swell up and appear to be full of seed, only to eventually give disappointment by the chaff it contains. Pollination is seldom effective if done as soon as the flower opens; it is better to wait a day or two, as the pollen does not readily lose its vitality. Another point to remember is that abundance of water given at or immediately after pollination is likely to cause failure. As a rule, the hybrids are more easily grown and flowered than their parents.



Photo: Cassell & Company, Ltd.

DENDROBIUM FORMOSUM GIGANTEUM (see p. 287).

with the tough ones of the latter. In inflorescence there is great variety; many produce blooms all along the growths of the preceding year, and others have pendulous, many-flowered racemes. The flowers themselves vary largely, from the long-spurred, tiny-flowered species of purely botanical interest, to the large, spreading blooms of *D. Phalænopsis*; the colour range is from pure white through varying shades of yellow, rose, and lilac to crimson purple of deepest dye.

Geographical Distribution.—Dendrobiums are confined to Asia and Australasia, and are most abundant in Moumein and Upper Burmah. The southern limit is reached by *striolatum* in Tasmania, and the northern limit by *amœnum* in North-West India. There is also a remarkable difference of altitude at which species are found.

Cultural Remarks.—On the whole, Dendrobiums are not difficult to manage, and their chief requirements are plenty of heat and moisture when growing freely; cooler and drier conditions when growth has finished for the season; plenty of light, only affording shade during the hottest part of a bright summer day or to preserve the flowers as long as possible; and a moderate amount of compost placed over ample drainage. Ventilation must largely be governed by external conditions, but where a house is devoted to Dendrobiums it should be closed early during the growing period, and walls, paths, pots, and plants freely syringed.

Potting.—As the rhizomes of Dendrobiums extend slowly, it is not necessary to make much provision of space for future growth. Potting or basketing ought never to be done unless new

growths are commencing to push forth roots. Make the plants firm by sticks and ties, and place the compost well up to the base of the new growth. Deal with each plant as it needs attention; never wait until a batch is ready. *D. Phalænopsis* prefers the compost placed lightly about its roots.

Receptacles and Compost.—Species having a pendulous habit should be grown in Teak baskets.

compost, but the last ingredient is not necessary unless the specimens potted are of large size and have a considerable amount of material about the roots.

Temperatures.—No hard and fast rule can be given for temperatures, as so much depends upon the heat at command, the external conditions, position, and locality. The figures will, however,



DENDROBIUM THYRSIFLORUM (see p. 287).

All members of the nobile group can be cultivated in pots, as they are of erect habit, but the dwarfier species are equally at home in baskets. *D. Phalænopsis* and allied species do best in baskets, as then the greatest amount of light can be afforded them. Tall growers like *fimbriatum* are more readily accommodated in pots, as stakes are necessary for their support; all the *densiflorum* and *thyrsiflorum* group require similar treatment. *Formosum*, though it may be well grown in pots, is better as a basket plant. Well-picked sphagnum, fibrous peat, crocks, and charcoal form a good

provide a good basis for an intelligent cultivator to work upon. January and February, 55° by night, 55° to 60° by day; March and April (growth usually commences), 60° to 65° by night, and 70° by day, rising a further 10° in bright weather; May, June, July, and August, 65° by night, rising to 85° by day, with sunshine; September and October, 60° to 65° by night, and 70° by day; November and December, 55° by night, rising to 60° by day. *Infundibulum*, *jamesianum*, and *speciosum* grow and flower best in an intermediate house.

Resting Period.—When growth has finished for the season—a condition indicated by the non-production of new leaves at the apex—nearly all Dendrobiums should be gradually moved from a high temperature to an intermediate (or even cooler) one, where, in a drier atmosphere, and with a reduction of the water supply, the growths will ripen and plump up. The leaves will fall from the deciduous species, but evergreen species ought not to receive such extreme treatment, either in temperature or lack of moisture. Until the flower buds are prominent continue the resting conditions, only giving water when signs of shrivelling are apparent. A few species, like *D. Phalaenopsis*, that flower soon after the completion of growth, are best removed to a Cattleya house, never allowing the compost to become quite dry.

Insect Pests.—Thrips and red spider will attack Dendrobiums when the atmospheric conditions are favourable, but as a rule these are unfavourable. It is only in ill-kept collections that scale or mealy bug secures a footing, but green fly will often appear at the growing tips. Sponging with an approved insecticide will remove these pests. There appear to be two distinct beetles that infest Dendrobiums, causing a large amount of damage by boring into and out of the growths or pseudo-bulbs. *Xyleborus perforans* and *Diaxenes Dendrobii* are their names, but as both have similar habits they demand similar treatment. The Dendrobies from New Guinea and neighbouring islands are most subject to attack, consequently importations ought to be carefully examined and have all bored and withered growths removed and burned. Moreover, it is necessary to keep the new stock under careful observation, and remove any growths that show marks of infestation by withering or by a black or brown discoloration; if such growths are found to be hollow when squeezed it is an additional indication of infestation. It is the grub that does the boring, and it spins the cocoon from which the beetle emerges. The beetle is equally dangerous, as it feeds on leaf and growth. Besides burning all infested portions of the plant a further remedy is to hunt for the beetles at night, with a lantern; they are about $\frac{1}{2}$ " long, brownish grey, lined with white or yellow.

Principal Species and Varieties :—

aggregatum majus, 1', Ap., yel.
americanum, 1½', Je., wh. yel. (*syn. mesochlorum*).
aureum, 1½', Jan., Feb., yel., red, fragrant (*syn. heterocarpum*).
Bensonae, 2', My., Je., wh., crim., pur., or.
bigibbum, 1½', Sep., Oct., magenta pur.
brymerianum, 1½', Feb., Mch., deep yel.
chrysanthum, 6', Sep., or., yel., maroon.
chrysothoxum, 1', Mch., Ap., yel., or.
crassinode, 2', Jan., Mch., wh., pur., or.
cretaceum, 1', My., Je., creamy wh.
dalhousianum (*see pulchellum*).
densiflorum, 1½', Mch., My., or. yel.
devonianum, 3', My., Je., wh., pur., or.
Falconeri, 4', My., Je., wh., shaded ro., pur., or.
Farmeri, 1½', My., Je., yel.
fimbriatum oculatum, 4', My., or., yel., maroon (*syn. Paxtonii*).
findlayanum, 1½', Feb., Ap., pale lil., yel.
formosum giganteum, 1½', My., wh., yel. (*see p. 285*).
Hildebrandtii, 2', Mch., My., yel., or.
infundibulum, 2', Je., wh., or.
Johnsonae, 8", Jan., Mch., wh., lip marked pur. (*syn. Macfarlanei*).
linawianum, 1½', rosy pur., wh., pur.
lituiflorum, 2', Ap., My., rich pur., wh.

luteolum, 1½', Mch., Ap., rosy yel.

MacCarthyi, 1½', Aug., ro., wh., pur.

macrophyllum Veitchii, 1½', yel., wh., pur.

nobile, 2', Jan., Mch., ro., pur., wh., dark pur.

A few choice vars. of this widely cultivated and variable species are *hallianum*, *cooksonianum*, *Hackbridge var.*, *nobilis*, and *sanderianum*.

Phalaenopsis, 2', Oct., Nov., mauve, rosy pur. There are several beautiful forms of this popular species, notably *album*, *Appleton's var.*, *hololeucum* (wholly white), *schröderianum*, and *statterianum*.

Picardii, 2', Ap., whitish.
primulinum, 1½', Feb., Mch., primrose, ro., pur.

Principal Hybrids :—

Ainsworthii (*aureum* × *nobile*), Feb., Mch.
 — *leechianum* (*aureum* × *nobile*), Feb., Mch.
 — *splendidissimum* (*aureum* × *nobile*), Feb., Mch.
 — *splendidissimum grandiflorum* (*aureum* × *nobile*), Feb., Mch.
Aspasia (*aureum* × *wardianum*), Mch.
Cassiope (*monoliforme* × *nobile albiflorum*), Feb., Mch.
chlorostele (*linawianum* × *wardianum*), Jan., Feb.
chrysodiscum (*Ainsworthii* × *findlayanum*), Feb.
Clio (*Ainsworthii* *splendidissimum* *grandiflorum* × *wardianum*), Mch.
crassinode - *wardianum*, Mch.
curtisianum (*Cassiope* × *aureum*), My.
dulce (*aureum* × *linawianum*), Mch.

Other Species and Hybrids :—

alatum, 2', spr., pk.
albosanguineum, 1½', Ap., wh., red.
amethystoglossum, 3', Jan., Feb., wh., pur.
Aphrodite, 1', Jy., Aug., cream, yel.
aqueum, 1', Nov., grn., wh. (*syn. album*).
atroviolaceum, spr., wh., pur. (*see p. 284*).
barbatulum, 1½', Mch., wh., red.
Boxallii, 3', Feb., Mch., wh., pur., yel.
Bryan (*luteolum* × *wardianum*), Mch.

(*syn. nobile pallidiflorum*, *Hooker*).

pulchellum, 4', Ap., My., pale yel., shaded ro., blotched maroon (*syn. dalhousianum*).

signatum, 1½', Mch., wh., yel., br.

speciosum, 1½', Feb., Mch., buff.

— *Hillii*, creamy wh. (*see p. 288*).

spectabile, 1½', Dec., buff, pur., crim.

superbians, 2½', aut., crim., pur.

superbum, 3', Ap., Mch., rich pur. (*syn. macranthum*).

Three distinct vars. are *anacum*, scentless; *Burkei*, wh., pur.; and *Dearei*, pure wh.

thyrsoiflorum, 2', Ap., My., wh., yel. (*see p. 286*).

wardianum, 3', Feb., Mch., wh., deep pur., or., maroon.

endocharis (*monoliforme* × *aureum*), Mch.

euosum (*endocharis* × *nobile intermedium*), Mch.

Euryalus (*Ainsworthii* × *nobile*), Mch.

melanodiscum (*findlayanum* × *Ainsworthii*), Jan., Mch.

Melpomene (*signatum* × *Ainsworthii* *splendidissimum* *grandiflorum*), Mch.

micans (*wardianum* × *lituiflorum Freemanii*), Mch.

Niobe (*tortile* × *nobile*), Ap.

Rolfæ (*nobile* × *primulinum*), Mch.

schneiderianum (*findlayanum* × *aureum*), Mch.

statterianum (*Bensonae* × *crystallinum*), Aug.

Venus (*nobile* × *Falconeri*), Ap.

Wiganie (*signatum* × *nobile*), Ap.

wiganianum (*Hildebrandtii* × *nobile*), Feb.

Calceolaria, 2', Je., or., pk. (*syn. moschatum*).

cambridgeanum (*see ochreatum*).

canaliculatum, 1', Feb., yel., pur.

capillipes, 4", Ap., yel.

cariniferum, 9", Ap., wh., or., red.

chlorops, 1½', Jan., Feb., creamy wh.

Cologyne, 6", Oct., Nov., buff, pur., or.

Cordelia (*euosum* *leucopterum* × *aureum*), Mch.

crepidatum, 1½', Ap., wh., pk., or.

cretaceum roseum, 1', My., cream, ro.
 cruentum, 1', Sep., wh., red.
 crystallinum, 1½', Jy., wh., pur., or.
 cumulatum, 2', Sep., lil.
 Cybele (nobile × findlay-anum), Mch.
 D'Albertisii, 1½', Aug., wh., grn., red.
 dalhou-nobile, Je., pur., yel.
 dayanum, var. of macrophyllum.
 Dearci, 3', Jy., Aug., wh., yel.
 dixanthum, 2½', Je., Jy., yel.
 Doris (Ainsworthii leechianum × moniliforme), Mch.
 Draconis, 1½', My., Je., wh., or.
 Euterpe (nobile × wardianum), Mch.
 Freemanii, var. of lituiflorum.
 fuscum (see Gibsonii).
 fytchianum, 1', Ap., My., wh., ro.
 Gibsonii, 2', Je., or. (syn. fuscum).
 graciosissimum, 1½', spr., wh., ro.
 griffithianum, 1½', Mch., yel.
 harveyanum, 9", My., yel., or.
 Hillii (speciosum var.).
 hookerianum, 6', Sep., yel., maroon.
 Huttoni, 2', spr., crim., pur., wh., yel.
 illustre (pulchellum × chrysotoxum), Je.
 jamesianum, 1½', My., wh., red (syn. infundibulum jamesianum).
 japonicum (see moniliforme).
 Jenkinsii, 1', My., yel.

Kenneth (Bensonæ × MacCarthiae), Mch.
 kingianum, 6', Feb., pk., ro.
 linguiforme, 4', Mch., pur.
 Lowii, 1', Nov., yel., red.
 Macfarlanei (see Johnsonæ).
 macranthum (see superbium).
 mesochlorum (see amœnum).
 moniliforme, 9', spr., wh., pur. (syn. japonicum).
 moschatum (see Calceolaria).
 Nestor (Parishii × superbium anosum), My.
 ochreatum, 9", Je., yel., pur. (syn. cambridgeanum).
 Parishii, 1½', Je., Jy., mauve, pur., maroon.
 Paxtonii, Paxton (see fimbriatum oculatum).
 porphyrogastrum (pulchellum × superbium Huttonii), Jy.
 sanguineum, 8', Sep., red.
 sanguinolentum, 6', Mch., yel., vio.
 Sihyl (linawianum × bigibbum), Mch.
 stratiotes, 6", sum., wh., vio., pur.
 suavissimum (a var. of chrysotoxum).
 teretifolium, 1', Jy., pur.
 tetragonum, 2', My., yel., grn., red.
 tortile, 6", My., wh.
 transparens, 1½', Mch., wh., ro.
 undulatum, Mch., yel., br.
 veitchianum (see macrophyllum).
 Victoria - Regina, 1½', Aug., vio., bl.
 Virginia (Bensonæ × moniliforme), Mch.
 Wattii, Jan., wh., yel.

DENDROSERIS.

Small trees (*ord.* Compositæ) that rarely branch. A greenhouse temperature and a compost of good loam and sand will suit. Propagation by seeds.

Principal Species :—

macrophylla, 10', sum., micrantha, yel.

DEODAR (see CEDRUS DEODARA).

DEPARIA.

Rare stove Ferns (*ord.* Filices), consisting of three rare species from different tropical countries. Propagated by spores. The soil may consist of fibrous loam two-thirds, peat and chopped sphag-



DENDROBIUM SPECIOSUM VAR. HILLII (see p. 287).

DENDROCHILUM (see PLATYCLINIS in part).

DENDROMECON.

This small genus (*ord.* Papaveracæ) is represented in gardens by rigidum, a somewhat shrubby species that is hardy in the south of England and Ireland, but elsewhere must, like several other Californian plants, be regarded as half-hardy. It is propagated by seeds or cuttings, and grows best in rich, well-drained loam, and a sunny situation. The yellow flowers are produced in June.

DENDROPANAX.

Handsome stove foliage plants (*ord.* Araliacæ) requiring similar treatment to that accorded to Aralia and Panax.

Principal Species :—

arborescens, 12', Jy., yel. japonicum, 12', sum., yel. (syn. Aralia arborea).

Dendrium (see *Leiophyllum*).
Dendrocolla (see *Sarcocollis*).
Dendrolirium (see *Eria*).

num, with broken potsherds, one-third. One of them is similar in habit to *Dicksonia adiantoides*.

Principal Species :—

prolifera, fronds 6" to 12", st. (syn. *Macraei*).

DEPPEA.

Stove or greenhouse shrubs of slender habit (*ord.* Rubiacæ). Propagation is by cuttings of shoots getting firm at the base, in sand, in a propagating case. Soil, loam two-thirds, peat one-third, with sufficient sharp sand to render the compost porous.

Principal Species :—

erythrorhiza, 1' to 3', grh., yel.

Dendrospartum (see *Genista*).
Denhamia (see *Culcasia*).
Dennstedtia (see *Dicksonia*).
Dentaria (see *Cardamine*).
Dentidia (see *Perilla*).

DEPRESSARIA.

A genus of moths (*ord.* Tineina) of small size, three of which are at times troublesome to Carrots and Parsnips. *Applana* (*syn.* *cicutella*), the common flat-body moth, draws the leaves together with its webs and devours them. *Pastinacella* (*syn.* *daucella*) serves the umbels of flowers in the same way; and *depressella* devours the flowers and seeds. By way of remedy, the caterpillars may be shaken into tarred trays, a boy holding the tray while another goes along the lines and shakes the plants over the trays. A quicker method is to dust the affected parts with Hellebore powder while wet.

DERMATOBOTRYS.

A deciduous, perennial, greenhouse plant (*ord.* Scrophularineæ), recently introduced from Natal. Propagated by cuttings, and by seeds when obtainable. Fibrous loam two-thirds, and leaf mould and sand one-third, will answer for compost.

Only Species :—

Saundersii, 1', red., yel.; the tubular flowers are borne in whorls below the new set of leaves.

DERRIS.

A genus of tall, climbing, stove shrubs (*ord.* Leguminosæ), rarely forming trees. Propagation, by cuttings in sand in a propagating case. Loam and peat in equal parts, with a good dash of sand, suit.

Principal Species :

dalbergioides, ro. *elliptica*, red. *scandens*, ro.

DESFONTAINEA.

A handsome, evergreen shrub (*ord.* Loganiaceæ), of erect habit, hardy in the more favoured parts of the British Isles, succeeding best in the more northern parts in the vicinity of the sea, and with the shelter of a wall. Flowers long and widely tubular, or funnel-shaped. Propagation, by cuttings in sandy loam and peat under a bell-glass in heat. Any friable, well-drained soil will suit it if planted out, but the addition of one-third of peat will be an improvement. It makes a handsome greenhouse or conservatory subject in pots or planted out in well-lighted positions (*see* figure).

Principal Species :—

spinosa, 3', Aug., hdy., sc., yel. (*syns.* *acutangula*, Hooker, and *splendens*).

DESIGNS.

Operations on a large scale are generally left to the genius or skill of the professional landscape gardener, and those who have no time, knowledge, or special faculty for laying out gardens and parks, or any special part thereof, should call in professional aid. There are many gardeners and amateurs, however, who can seize upon the beauty of appropriateness in designing gardens or pleasure grounds. An appropriate design can only be conceived and put into workable form by someone thoroughly acquainted with the capabilities of any given situation and its surroundings, or by visiting and thoroughly surveying the place. The design may then be transferred to paper, if on a scale sufficiently great to merit this. To imitate some other garden, merely because its design is pleasing, would be to court failure, unless the level or general trend of the ground and its surroundings were the same. A lake on the top of a mound or hill would be an eyesore and altogether inappropriate. An elevated rocky on the middle of a flat piece of ground

would be like a wen or an exaggerated molehill, and altogether undesirable. Lakes, ponds, or other sheets of ornamental water, if not at the lowest level of the ground, should be at a sufficient distance below the highest point to make it appear that the water is the natural drainage of the heights. Streams should occupy the lowest level of a valley, and not be made to run parallel with it at any higher elevation. Geometrical designs are most appropriate in the vicinity of buildings. At a distance from such, irregular designs, devoid of formality, are most appropriate in British landscape. Sharp curves in walks, drives, and paths should never be introduced, unless there is an obvious reason for making them. In getting from point to point the nearest way is the most appropriate, making due allowance for the contour of the



A SPRAY OF DESFONTAINEA SPINOSA.

land and the easiest line of ascent or descent. If anything is imported to a place it should be such as to heighten the effect of the natural design or lay of the land, to make it more expressive or impressive, to heighten the magnificence, accentuate the simplicity, or deepen the tranquillity of a solitude. There should be nothing contradictory to mar the design as originally fashioned or modelled by Nature.

DESMODIUM.

Hardy, greenhouse, and stove shrubs (*ord.* Leguminosæ). Propagation is by young side shoots getting firm, in sand, under a bell-glass in a stove, except where hardy; also by seeds. Soil, fibrous loam two parts, leaf mould one part, with plenty of sand.

Principal Species :—

canadense, 3' to 4', Jy., hdy., pur. A good shrubby plant. *gyrans*, 3', Jy., st., vio. The Telegraph Plant.

Other Species :—

ascendens ceruleum, st., bl. *penduliflorum* (*see* *Lespedeza bicolor*).
alatum (*see* *triquetrum*). *podocarpum*, 2', Jy., grh., pur.
biarticulatum, 2', Jy., st., yel. *pulchellum*, 3', Jy., st., pur.
laburnifolium, st. *Skimmeri* albo-nitens, pur.
latifolium, grh., pur. (*syn.* *Hedysarum latifolium*, *Rochburgh*).
nutans (*see* *tiliaefolium*). *tiliaefolium*, sum., bl.
 triquetrum, 10', Jy., st., pur. (*syn.* *alatum*).

DESMONCUS.

Stove Palms (*ord.* Palmæ) of slender, climbing habit, suitable, in the case of the taller ones, for training against pillars or tree stems. Propagation, by imported seeds. Soil, fibrous loam and a third of leaf mould or peat, with sand.

Principal Species :—

americanus, 6'.	minor.	orthacanthos, 6'.
major.	mitis.	polyacanthos, 6'.

DETARIUM.

A small genus of stove shrubs or trees (*ord.* Leguminosæ). As the flowers have no petals their beauty is dependent upon the stamens, as in *Acacia*. *Senegalense* may be propagated by

Other Cultural Points.—All may be planted in beds and shrubberies, in certain positions relative to their height, but *crenata* and *scabra*, with the fine varieties of the former, are most suitable for this purpose. *Gracilis* makes a much dwarfer bush, 1½' to 2' high, and may be planted in beds by itself, or as edgings to taller subjects. In the more northern and colder parts of the British Islands *crenata* and *scabra* should have the shelter of a wall, the rest being relegated to the greenhouse. Seeing that standards are so popular for greenhouse and conservatory decoration, *scabra* might be so trained that the main stem may develop a head, the shoots of which should be shortened back annually so as to maintain the



Photo: Cassell & Company, Ltd.

DEUTZIA CRENATA (see p. 291).

cuttings of half-mature wood in sand in a case. Loam and peat in equal proportions, with sand, will meet its requirements.

DEUTZIA.

Description.—Highly ornamental, deciduous shrubs (*ord.* Saxifragæ), with white flowers terminating the stems and short side shoots.

Propagation.—By cuttings of short side shoots taken off with a heel of the old wood in spring, inserted in sand in pots, and plunged in the fibre of a propagating case, or placed under a bell-glass. Strong shoots may also be taken off in autumn, firmly and deeply inserted in prepared soil in a sheltered position, and left there for a year.

Soil.—Any friable, well-drained soil will answer their requirements. For pot culture use good, fibrous loam with a little leaf mould and sand.

Desmidorchis (see *Boucerosia*).

Desmotrichum (see *Dendrobium*).

symmetry of the whole. Old shoots should be cut out occasionally to make room for young ones. *Gracilis* grafted on stems of *scabra* might be grown in the same way. For pot culture *gracilis* is the most serviceable and important of all. For flowering in small pots young plants should be frequently raised from cuttings and grown to a useful size. After flowering these may have the old shoots thinned out, and the plants may be transferred to the open ground in June to acquire fresh vigour. When these get too large some growers divide the pieces with a hatchet so as to get them into smaller pots; but neater and more vigorous plants are obtained from cuttings as above stated. When large specimens are desired they may simply be shifted into larger pots as they require it till the limits are reached. Large specimens may be grown in the same pots for ten or twelve years, without being shifted, by feeding with liquid and artificial manures when making their growth. Good substantial soil and efficient drainage should be

given for this method of treatment. Merely thin out old shoots and shorten others from year to year where necessary.

Principal Species and Varieties :—

- crenata*, 4' to 6', Je., Jy., wh. The best flowering species for the open air (*syns.* *Fortunei*, *scabra*, [*of Lindley*], *scabra crenata*, and *Watereri*).
— *flore pleno*, double, wh.
— *flore pleno extus purpurea*, wh., ro. on the outside.
- *punctata*, spotted.
gracilis, 2', Ap. to Je., wh. The best for pot culture.
— *foliis aureis*, lvs. yel.
Lemoinei, 2', My., Je., wh., hybrid.
scabra, 6', My., Je., wh. The strongest grower.

Other Species :—

- corymbosa*, 5', wh.
discolor, wh., ro.
— *purpurascens*, ro. pur.
- parviflora*, 3', wh.
staminea, 3', Ap., My., wh.

DEYEUXIA.

Greenhouse Grasses (*ord.* *Gramineæ*) grown for decorative purposes. Propagation is easily effected by division. Loam, leaf mould, and sand will suit admirably for soil.

Principal Species :—

- elegans variegata*, lvs. 1' to 1½', deep grn., edged yel.

DIACALPE.

A stove Fern (*ord.* *Filices*) having fronds much resembling those of *Davallia nodosa*, often covered with coarse hairs, which soon fall away. Propagation, by division. Soil, loam and peat in equal proportions, with some chopped sphagnum, and broken pots with sand to ensure drainage.

Only Species :—

- aspidioides*, fronds 2' to 3'.

DIACRIUM.

A handsome Orchid (*ord.* *Orchidaceæ*), allied to and often placed under *Epidendrum*. Propagation, by division of the pieces, with a leading bud to each. The compost should consist of fibrous peat and sphagnum, with some sand, placed over an ample drainage of crocks. Keep the plants well above the rim of the pots.

Only Species :—

- bicornutum*, 1½', sum., wh. (*syn.* *Epidendrum*).

DIADENIUM.

A stove Orchid (*ord.* *Orchidaceæ*), requiring moist and warm treatment. Propagation, by offsets and by division of the pieces. For soil, use fibrous peat and sphagnum in equal proportions, with a little sharp sand. Use well-drained Orchid baskets of moderate size, suspending them near the glass. Keep the compost moderately dry in winter.

Principal Species :—

- Barkeri* (*syn.* *Chananthe Barkeri*).

DIALIUM.

A small genus of stove shrubs or trees (*ord.* *Leguminosæ*). Propagation, by cuttings of half-ripened shoots in bottom heat. Guineense may

- Devil's Apples* (*see Mandragora*).
Devil in the Bush (*see Nigella*).
Devil's Bit (*see Scabiosa succisa*).
Devil's Herb (*see Plumbago scandens*).
Dewberry (*see Rubus coccineus*).

be grown in equal parts of peat and loam with sand.

DIAMOND-BACK MOTH.

The larvæ of this moth (*Plutella cruciferarum*) prey upon cruciferous crops generally, but are most troublesome to Turnips and Cabbages. The moths, which make their appearance in April, are about ½" across the forewings; the latter are greyish white, spotted with brown. The larvæ are green, and do their eating all through the summer, and the early part of the autumn. The moths should be caught, if possible, and freshly slaked lime should be dusted over the young plants while the dew is on them. It is only while the plants are young that they are in danger from the caterpillars; when they get older the leaves are too tough and strong.

DIANELLA.

Cool greenhouse plants (*ord.* *Liliaceæ*). Propagation, by seeds and division. The soil may consist of loam and peat in equal proportions. They may be planted out in cool houses.

Principal Species :—

- carulea*, 2', Je. (*syn.* *congesta*). *aspera*, bl. berries.

Other Species :—

- congesta* (*see carulea*). *revoluta*, 2', Aug. (*syn.* *divaricata*).
divaricata (*see revoluta*).
ensifolia, 1½', Aug., wh. *strumosa* (*see hevis*).
lævis, 2', Aug. (*syns.* *longifolia* and *strumosa*). *tasmanica*, berries bl.
longifolia (*see hevis*). — *variegata*, lvs. striped yel.
memorosa, 2', Aug.

DIANTHERA.

Stove or greenhouse herbs (*ord.* *Acanthaceæ*), rarely shrubby. Propagation, by cuttings in sand in heat, under a bell-glass or in a case. For soil use two parts loam, one part leaf mould, and sufficient sand to make it porous.

Principal Species :—

- americana*, 1' to 3', sum., (violet, wh. (*syns.* *Jacobinia* and *Beloperone ciliata*).
bullata, leaves pur. beneath. *illustris* (*see Porphyracoma lanceolata*).
ciliata, 2', win., pur., wh. *lanceolata* (*see Porphyracoma lanceolata*).

DIANTHUS. (PINK.)

Description.—Very beautiful border or rockwork flowers (*ord.* *Caryophyllæ*), generally very fragrant, and of charming form. The genus includes the Carnation (*Caryophyllus*) and the Pink (*plumarius*), which will be found described under the popular names. There are a large number of species, and only the best of those which are in gardens can be named here. *Barbatus*, the Sweet William, is an old favourite in cottage gardens.

Propagation.—By seeds sown in pots or pans in spring and placed in a frame or greenhouse. Also by cuttings or layers in August. The Mule Pinks, such as *Napoleon III.*, should be cut down after flowering to induce the formation of cuttings.

Soil.—The greater number of the species like a rather light and sandy soil, with the addition of a little peat.

Other Cultural Points.—The Alpine species generally prefer to grow in the crevices between stones, and in full sun, an exposure to the south or south-west suiting them well. *Alpinus*, however,

does not like the midday sun. Most of them ought to be top-dressed with sand and leaf mould once or twice a year.

Principal Species :

alpinus, 4', Je., red. An exquisite little Alpine, but not usually long-lived, from want of top-dressing.
barbatus, 1', Je., var. bien. The Sweet William. Well known to everyone.
*caesi*us, 6'', Jy., pale ro. The Cheddar Pink; a pretty little Pink, which likes limestone (see p. 293).
callizonus, 6'', Jy., ro. pk. A charming little flower.
Caryophyllus (see Carnation).
cinnabarinus, 9'', Jy., red. A beautiful, erect grower.
*cu*entus, 1½', Jy., sc.

deltoides, 6'', Je., etc., pk. The Maiden Pink; there is a wh. var. also.
glacialis, 3'', Je., red. A favourite with Alpine growers, but difficult to manage. S.W. aspect, loam, leaf mould, and sand. Vars. *gelidus* and *Freynii*.
neglectus, 3'', Je., ro. Another pretty species.
petraeus, 6'', Jy., wh. A charming species, with fringed flowers. There is a pretty double form.
plumarius (see Pink).
superbus, 2', Aug., whitish. Very beautiful, but practically a bien. It has many syns. and forms.

Hybrids and Varieties :—

There are many hybrid and seedling forms from various parents under garden names. The Mule Pinks, such as Napoleon III., Marie Paré, Emily Paré, Eugénie, etc., are pretty, and others, such as Beauty, Fettes Mount, M. Foster, Cyclops, and Atkinsoni, are desirable.

Other Species :—

arboreus, 1½', Jy., hlf-hdy. per., pk.
arenarius, 6'', Aug., pur.
Armeria, 1', Je., ann., red.
armerioides, 1', Je., red.
atrorubens, 1½', Jy., crim.
attenuatus, 6'', Jy., red.
brachyanthus, 3', Je., pk.
burchtormensis, 1', Jy., red.
campestris, 1', Aug., red, wh.
capitatus, 1½', Aug., pur.
carthusianorum, 1½', Jy., red.
chinensis, 1', Jy., bien., red. Var. *Atkinsoni* (syns. *Seguieri*, *dentatus*, etc.).
ciliatus, 1½', Jy., pk. (syn. *racemosus*).
Cyri, 1', Je., red.
divaricatus, 1', Aug., pur.
dubius, My., wh., pk.
erubescens, Jy., pale ro.
ferrugineus, 1½', Jy., bright red.
fimbriatus, 1½', Jy., br.
floribundus, 1', Jy., ro. pk.
fragrans, 1', Aug., wh.
fruticosus, 1½', Jy., pk.
furcatus, 9'', Jy., red.
gallicus, 9'', Aug., pur.
giganteus, 3', Aug., pur.
glaucohyllus, 1', Jy., red.
gracilis, 6'', Jy., ro.
graniticus, 6'', Je., red.
hendersonianus, 1', Jy., crim.; of garden origin.
hirtus, 1', Jy., red.

Hoeltzeri, Jy., pk.; a var. of *superbus*.
Hornemannii, 1', Aug., red.
leptopetalus, 1½', Jy., wh.
Libanotis, 3', Jy., wh.
liboschitzianus, 9'', Jy., wh.
liburnicus, 1', Aug., red.
 — *Knappii*, yel.
longicaulis, 1', Aug., wh.
microlepis, 3'', Je., red, wh.
monspessulanus, 1', Jy., red.
 — *albus*, wh.
 — *alpestris* (see p. 294).
multiuncatus, 1', Je.
nitidus, 6'', Jy., pk.
noëanus, 1', Jy., wh.
pallidiflorus, 9'', Jy., pur.
pelviformis, 1', Je., red.
pinifolius, 2'', lil.
polymorphus, 1', Ap., red.
prostratus, 6'', Sep., hlf-hdy. per., red.
pungens, 1', Aug., pk.
rigidus, 9'', Jy., red.
rupicolus, 1', Je., red (syn. *Bisignani*).
siculus, 9'', Aug., red.
squarrosus, 6'', Je., wh.
Sternbergii, 1½', Je., pk.
strictus, 6'', Jy., wh., pur. (syn. *integer*).
suaveolens, 1', Jy., wh.
sylvaticus, 1½', Je., red.
sylvestris, 1', Jy., ro.
tener, 6'', Jy., red.
viscidus, 6'', Jy., pur.
zonatus, 9'', Jy., wh., zoned br.

DIAPENSIA.

Diminutive, cushion-like, hardy shrubs (ord. *Diapensiaceæ*). Only one of the two known species is in cultivation, and that is both choice and rare. Propagation, by seeds or division of the tufts. Soil, sandy peat, in a cool, shady situation on the rockery. A reserve should be kept in frames and grown in pots.

Principal Species :—

barbulata (now *Pyxidantha barbulata*). *lapponica*, 3'', Jy., wh.

DIASCIA.

Slender, erect or diffuse, greenhouse annuals, rarely perennials (ord. *Scrophularineæ*). Flowers white or rosé. Propagation, by seed in spring, like half-hardy annuals, to be planted out later on in any friable, light garden soil.

Principal Species :—

Barbææ, 1', Jy., ro. pk.



Photo: Cassell & Company, Ltd.

DIANTHUS STRICTUS.

DIATEMA.

Perennial stove herbs (ord. *Gesneraceæ*), of dwarf habit, with creeping rhizomes. Propagation, by cuttings of the young, growing shoots in heat, under a bell-glass, and by division of the rhizomes. Soil, loam and peat in equal parts, with sand.

Principal Species :—

ochroleucum, 1', Aug., yel.
quinquevulnerum, Aug., wh., pk.
pictum, 9'', wh., pur.

DIBBER, OR DIBBLE.

The commonest and most useful form of this tool or instrument is that represented by the handle of a spade cut 12'' or 15'' below the head, and pointed. The tool is, in fact, often made from old spade handles. If the point is shod with iron it will last longer, and, while easily kept clean, will pierce the soil more readily when the latter is hard, heavy, or wet. Hundreds are in use, however, that are unshod. By lightly charring the point with fire,

Diaspis (see *Scale Insects*).

Diastella (see *Leucospermum*).

Diastemanthe (see *Stenotaphrum*).

Diastemella (see *Diastema*).

Diatoma (see *Carallia*).

and then making it smooth, it works admirably and lasts well. This form of dibber is useful for planting Cabbages and other plants with few roots, but when the latter are numerous the trowel should be preferred for the work. A long-stemmed dibber, with a cross-treadle or foot-rest about 6" above the point, is useful for planting Potatoes.

DICÆLOSPERMUM.

A stove climber belonging to the Gourd family (*ord.* Cucurbitaceæ), grown for the ornamental character of its fruit. The only species, *Ritchiei*, is propagated from seeds. Good, fibrous loam, a little leaf soil, and plenty of sand, will suit. It requires a moist, warm atmosphere.

Principal Species :—
eximia, 1', spr., sum., red pur. A beautiful little plant with graceful foliage and flowers (*syn.* *Fumaria eximia*).
spectabilis, "Lyre Flower,"

Other Species :—
canadensis, 6'', My., wh.
chrysantha, 3½', aut., yel.
cucullaria, 6'', My., wh. yel.
 "Dutchman's Breeches."
formosa, 6'', My., ro. pur. (*syn.* *saccata* and *Dielytra formosa*).

"Bleeding Heart," 1' to 2', spr., sum., ro. pur. A very handsome plant; there are vars. with wh. flowers and variegated foliage.

lachenaliaeflora, 1', spr., pk. (*syn.* *tenuifolia*).
scandens, pk., wh.
thalictrifolia, 3', Aug., yel. br. (*syn.* *Dactylicapnos thalictrifolia*).



Photo: Cassell & Company, Ltd.

DIANTHUS CÆSIUS, THE CHEDDAR PINK (*see p. 292*).

DICENTRA.

Description.—Very beautiful herbaceous plants (*ord.* Fumariaceæ), of value for the garden, and one or two for forcing for early bloom. For this purpose, *spectabilis* (*Dielytra spectabilis*) is well adapted, and is very ornamental. All are hardy with the exception of *spectabilis*, which in some districts requires a little protection.

Propagation.—The easiest method is by division of the roots in spring, taking care to secure a portion of the crowns, but *spectabilis* can also be grown from cuttings, taken off after some growth has been made, and struck under a hand-light.

Soil.—A rich, light, rather moist, peaty soil answers well, and all thrive in shade.

Other Cultural Points.—In forcing *spectabilis* it should have a moist temperature of from about 50° to 55°, as a greater heat is not suitable, and forcing must be gently done.

Dibblemma (*see Polypodium*).

Dibrachion (*of Regel, see Homalanthus*).

Dicalymna (*see Podachænum*).

DICHÆA.

Epiphytal stove Orchids (*ord.* Orchidaceæ) with slender, elongated stems, covered with the sheaths of the closely set, two-ranked leaves. Propagation, by division. Soil, fibrous peat and chopped sphagnum, with ample drainage in baskets.

Principal Species :—
picta, grn., spotted pur.

DICHILUS.

Slender, erect, greenhouse shrubs (*ord.* Leguminosæ), with evergreen foliage like that of a *Cytisus* or *Crotalaria*, to which they are allied. Flowers, nodding. Propagation, by cuttings of side shoots just getting firm, in sand under a bell-glass. Soil, loam, peat, and sand.

Principal Species :—
lebeckioides, 2½'. Ap., wh., yel

Dicentranthera (*see Asystasia*).

Dicerma (*see Desmodium*).

Diceros (*of Persoon, see Artanema*).

DICHOPOGON.

A greenhouse perennial herb (*ord.* Liliacæ), with a tuberous rootstock. Propagation, by division. Soil, loam and leaf mould, with sand; or peat may be used instead of the leaf mould.

Principal Species :—

strictus, $1\frac{1}{2}$ ', pur., flowers $1''$ to $1\frac{1}{2}''$ diam., scented like *Heliotrope* (*syn.* *undulatus*).

DICHOPSIS.

Evergreen stove trees (*ord.* Sapotacæ), valued for their foliage, but in some cases as the source of

positions. Some of the taller ones, such as *thyrsiflora*, may be planted out under the shade of Palms or other subjects.

Principal Species :—

mosaica, 2', st., bluish wh., lvs. lined wh. like mosaic.
— *gigantea*, 2', st., bluish wh., lvs. $9''$ long, $5''$ wide.
pubescens tæniensis, bluish wh., lvs. striped wh.

(*syn.* *pubescens talmiensis*).
thyrsiflora, 3' to 10', aut., win., bl. The handsomest of all when well grown.
undata, 2', lvs. undulated, striped silvery grey.



DIANTHUS MONSPESSULANUS VAR. *ALPESTRIS*; DWARFER THAN THE TYPE (*see p.* 292).

gutta-percha, which is prepared from the milky juice. Propagation, by cuttings in a propagating case. Soil, fibrous loam and peat, with a liberal proportion of sand.

Principal Species :—

Gutta, "Gutta-Percha" *oblongifolia*.
(*syn.* *Isonandra Gutta*).

DICHORISANDRA.

Description.—Bold and handsome stove perennials (*ord.* Commelinacæ), some of which are valued for their foliage, and others for their flowers. The stems are mostly erect, with medium or large leaves.

Propagation.—By seeds, in pans of light, peaty soil in stove heat in spring. Division of the plants when growth is commencing is another method.

Soil.—About one-third each of fibrous loam, peat, and leaf mould, with a good dash of sharp silver sand, will answer the purpose.

Other Cultural Points.—Most of these plants are of easy culture in an ordinary collection of stove plants, provided the glass is shaded in summer, or the pots containing them are stood in shady

Other Species :—

albo-marginata, lvs. edged wh.
aubletiana, Aug., bl., yel.
gracilis, $1\frac{1}{2}'$, Aug., bl.
leucophthalmos, Jé., bluish wh.
ovalifolia, My., pur.

oxypetala, 2', Aug., red.
picta, 6'', Sep., bl.
puberula, 3', Aug., bl.
Saundersii, 2', Jy., wh., vio.
Sieberi, $1\frac{1}{2}'$.
vittata, lvs. purplish, with two wh. lines.

DICHROA.

A genus of stove shrubs (*ord.* Saxifragæ), with large flowers varying from blue to lilac. Propagated by seeds or by cuttings of half-ripened wood in heat. Fibrous loam, leaf soil, and plenty of sand will answer for compost.

Only Species :—

febrifuga, large bl. berries (*syn.* *Cyanitis*).

DICHROSTACHYS.

Stove shrubs (*ord.* Leguminosæ), allied to *Adenanthera* and *Neptunia*, with flowers in two-

Dichosema (*see Mirbelia*).

Dichosma (*see Agathosma*).

coloured spikes, the upper being perfect and yellow, the lower neuter and pink or purplish. Propagated by cuttings in a warm case. Loam two-thirds, peat and leaf soil one-third, with plenty of sand, will suit.

Principal Species :—

cinerea. nutans. platycarpa.

DICHTROTRICHUM.

Stove shrubs (*ord.* Gesneraceæ) with evergreen foliage and the habit of *Æschynanthus*, the stems creeping or climbing on the stems of trees by their roots. Propagation is by cuttings in sand; with

let this remain for a year. When used, it should be mixed with about a fourth of its bulk of coarse grit.

Other Cultural Points.—The tree Ferns are only suitable for large houses, but they may be grown either in pots or planted out. Antarctica may be employed out of doors for sub-tropical bedding. Many of the species produce quantities of aerial roots, and these should be syringed twice or thrice daily, as they help the plants considerably. Plenty of water is necessary at all times, and liquid cow manure may be given twice or thrice weekly in summer. If the young fronds are too near the glass, they may be brought down by attaching

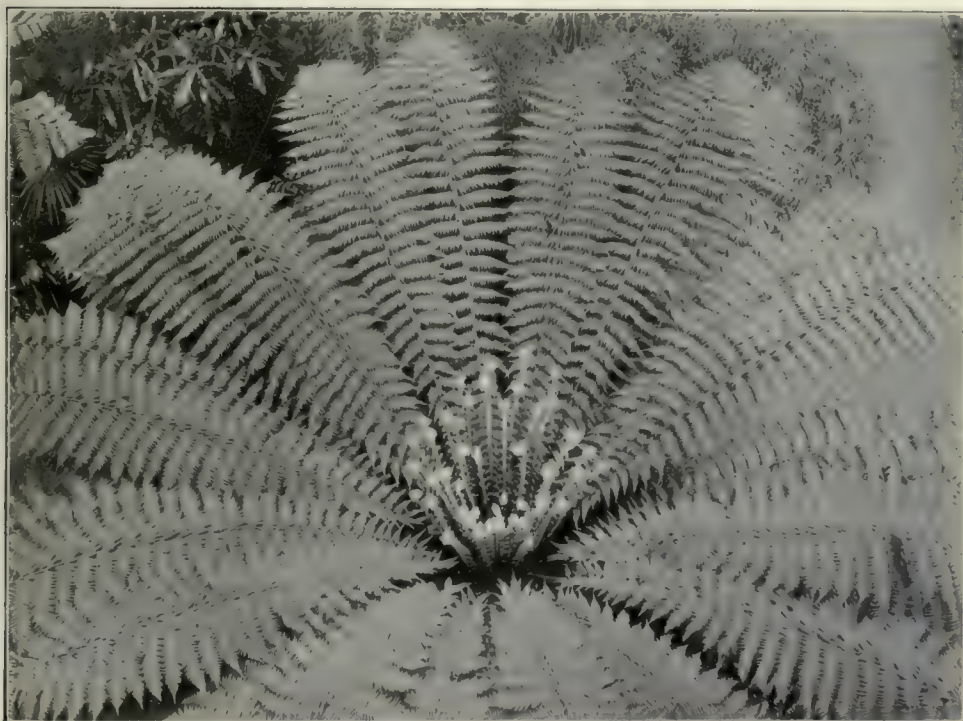


Photo: E. J. Wallis, Wandswoth, S.W.

DICKSONIA ANTARCTICA.

bottom heat, in a case or covered by a bell-glass. Loam and peat in equal parts, with plenty of sharp sand, in baskets, are suitable.

Principal Species :—

ternatum. Jy., crim.

DICKSONIA.

Description.—A large genus (forty species) of Ferns (*ord.* Filices). Many of them are tree-like, and even under cultivation attain to noble proportions.

Propagation.—By spores, sown when ripe in a close, warm frame.

Soil.—Two-thirds of good loam and one-third of leaf soil, with sand, for the smaller-growing species. For the tree Ferns it is advisable to build a stack of alternate layers of loam and cow manure, and

weights to them. The chief insect enemies are mealy bug, snowy fly, and thrips. Fumigation and sponging with soapy water are the remedies.

Temperature for the stove species, 60° minimum; for the greenhouse species, 40° minimum—45° is a good winter night temperature.

Principal Species :—

antarctica, 30' to 35', fronds 5' to 12', grh., a noble tree Fern (*syn.* Billardieri) (*see figure*).
apiifolia, 3' to 5', st. (*syns.* tenera of gardens and Davallia apiifolia).
berterouana, 6' to 15', fronds 3' to 5', grh., a tree Fern with slender stems and spreading head.
chrysotricha, fronds 3' to 5', st. (*syn.* Blumei).
Lathamii, fronds 14' to 15', st.; hybrid.

Menziesii, fronds 3' to 4'.

—pruinata, much cut.

regalis, fronds 3' to 7', grh. (*syn.* Cibotium regale).

sellowiana, fronds 6' to 9', st., a handsome tree Fern.

squarrosa, 15' to 20', fronds 4' to 6'.

Wendlandii, fronds 6' to 9', a tree Fern with great spread of fronds (*syn.* spectabilis of gardens).

Dichroma (of Cavanilles, *see Ourisia*).

Other Species and Varieties :—

adiantoides, fronds 3' to 6', st. (*syn.* obtusifolia).
arborescens, 10' to 12', fronds 3' to 6', grh.
assamica (*see* Barometz).
Barometz, fronds 3' to 6', st. (*syn.* assamica).
Billardieri (*see* antarctica).
Blumei (*see* chrysotricha).
Chamissoi, fronds 3' to 6', st.
cicutaria, fronds 2' to 5', st. There are several vars., of which dissecta of Sieber, erosa, incisa, and tenera of Martins are the best.
Culcita, fronds 3' to 6', grh. The wool from the rhizomes is used for stuffing mattresses.
cuneata, fronds 1' to 2', st.
davallioides, fronds 1' to 2', grh.
— Youngii, fronds 1½' to 3', warm grh.
Deplanchei.
dissecta (*see* rubiginosa).

dissecta (of Sieber, *see* cicutaria).
fibrosa, grh.
flaccida, fronds 1½' to 3', st., close to rubiginosa.
glauca, 1' to 1½', st.
moluccana, fronds 2' to 3', st. Scandens is very close, possibly a var.
obtusifolia (*see* adiantoides).
princeps, of gardens (now *Cyathea insignis*).
rubiginosa, fronds 3' to 5', st. (*syn.* dissecta).
Anthriscifolia is a var.
scabra, fronds 3' to 4', st. (*syn.* Sitalobium strigosum, of gardens).
Schiedei, 10' to 15', fronds 3' to 6', grh.
spectabilis (of gardens, *see* Wendlandii).
tenera (of gardens, *see* apiifolia).
Youngiae, fronds 2' to 3½', grh.

DICLIPTERA.

A large genus of stove and greenhouse annuals and perennials (*ord.* Acanthaceæ). Propagation, by seeds in heat for annuals; cuttings of side shoots getting firm at the base in the case of perennials. Give bottom heat in a case. Fibrous loam two parts, peat and leaf soil one part, with sand and good drainage, suit.

Principal Species :—

tweediana, aut., or. red.

Other Species :—

assurgens, 2', Jy., red.
bivalvis, 6', Je., pur.
chinensis, Sep., pale bl.
martinicensis, 2', Jy., pur. (*syn.* Justicia martinicensis).
pectinata (*see* Rungia parviflora).
peruviana, 2', Je., pur.

resupinata, 1½', Mch., ann., wh. pur.
retusa, 2', Jy., pur.
sexangularis, 2', Jy., red.
spinosa (*see* Barleria lupulina).
verticillaris (now Hypoestes verticillaris).

DICRANURA. (PUSS MOTH.)

The Puss Moth is so named on account of its soft grey and downy body having been compared to that of a cat. Entomological names for it are Dicranura vinula and Cerrura vinula. The forewings of the perfect moth are whitish, with numerous grey V-like and other black marks beyond the middle, with an expanse of 2½" to 3". The caterpillars are dark green, with a brown blotch, edged white, upon the back, and feed upon Willows and Poplars. As they are 2" long and conspicuous, hand-picking is the best remedy.

DICTAMNUS. (FRAXINELLA. BASTARD DITTANY.)

Very pretty, hardy border flowers (*ord.* Rutaceæ), which do well in rather dry soil, but can be grown almost anywhere. They are particularly interesting from the inflammable resin on the stems, which,

when the plants are in full bloom, is said to burst into flame when a lighted match is applied, without injuring the plant. The evening is the best time to see this. The Dictamnus is best propagated from seed, sown when ripe, if possible, although it will do in spring. The plant is difficult to divide. A good, rich soil, dry beneath, will suit. The Dictamnus dislikes removal when large, and the seedlings should be placed in position when young, or grown in pots and turned out with the ball attached.



Photo: Cassell & Company, Ltd.

DICTAMNUS ALBUS.

Principal Species :—

albus, 3', My., wh. The type plant, although the pur. var. is often grown as the type under the name of D. Fraxinella. There are several forms, that known as caucasicus or giganteus being taller and finer than the pur. form of the typical albus (*syn.* Fraxinella alba).

dasycarpus. This is not in cultivation, and is probably only a form of the foregoing.

DICTYANTHUS.

A small genus of stove twiners (*ord.* Asclepiadæ), with rather large, whitish, brown spotted or elegantly netted flowers. Propagation, by cuttings of side shoots getting firm, inserted in sand, with plenty of heat, but not overwatered. Fibrous loam and peat, with silver sand and some broken crocks to keep the soil open, will answer.

Principal Species :—

Pavonii, 10', Sep., greenish br.

Dicrypta (*see* Maxillaria).

Diclinotrys (*see* Chamælorium).

Dictiptera scorpioides (of gardens, *see* Jacobinia Mohintlii).

DICTYMIA.

A few species of greenhouse Ferns (*ord.* Filices) which are now referred to Polypodium. *Attenuata* is known as *Polypodium attenuatum*, *P. ziphophoron*, and *P. gladiatum*. The fronds are 6" to 18" long, very leathery, and entire or slightly scalloped. Propagation, by division of the long, creeping rhizomes. Loam and peat in equal parts, with a quantity of sphagnum, some broken crocks and sand, will make a suitable compost.

Principal Species :—
attenuata, 6" to 18".

DICTYOCARYUM.

A genus of about four species of stove Palms (*ord.* Palmæ) of tall habit, with ringed stems, and the segments of the leaves wedge-shaped, with the veins arranged like a fan. Propagation, by imported seeds. Fibrous loam and peat, with a good dash of sand, suit.

Principal Species :—
glaucescens Wallisii.

DICTYOSPERMA.

A tropical genus of Palms (*ord.* Palmæ), with slender stems often growing several together from one rootstock. The leaves are graceful. The cultivated species are from Madagascar and Mauritius, where they are said to grow from 15' to 30' high; under cultivation, however, stems more than a few feet in height are rare. They require a moist stove and rich, loamy soil.

Principal Species and Varieties :—
album, 15' to 30', lvs. aureum, 10', lvs. 3' to 4'.
6' to 7'. fibrosum, 5', lvs. 4' to 5'
— *furfuraceum*. (yields Piassava fibre).
— *rubrum*.

DICTYOXIPHIMUM.

Stove Ferns from Panama (*ord.* Filices). One species only is known; it is distinguished by simple, sword-shaped, sterile and fertile fronds 2' to 3' long, the sterile ones being 2½" wide, the others half that width. It thrives under the usual conditions given to stove Ferns. Propagation, by division of the crowns.

Only Species :—
panamense, fronds 2' to 3'.

DICYRTA.

Dwarf-growing herbaceous plants (*ord.* Gesneraceæ) from South America, with opposite, long-stalked leaves and small, tubular flowers. They may be increased by division in spring, and thrive in a mixture of peat, loam, and leaf mould in equal proportions, with a good dash of coarse sand. A stove temperature is required.

Principal Species :—
candida, 1' to 1½', Jy., wh. warscewicziana.

DIDISCUS (see TRACHYMENE).

DIDYMOCARPUS.

Perennial herbaceous plants (*ord.* Gesneraceæ), in a few cases with short stems, but more often

without. They usually assume a Primrose-like habit, with umbels of pretty blue, lilac, white, or yellow *Streptocarpus*-like flowers. They are natives of tropical Asia, and require the temperature of a stove. Seeds, cuttings of young shoots, and division in spring are suitable methods of propagation, while a mixture of peat, loam, and sand meets their requirements.

Principal Species :—

crinita, 6" to 8", Je., wh. *primulæfolia* (see humboldtiana).
humboldtiana, 4" to 6", Sep., Oct., lil. (syn. Rexii (see *Streptocarpus primulæfolia*).
malayana, 4" to 6", Jy., Rexii).
yel.

DIDYMOCHLÆNA.

Stove Ferns (*ord.* Filices), one or two species only being known. *Lunulata* is the only cultivated species; it is widely distributed throughout the Tropics, and is very ornamental. It has large fronds, and succeeds in a mixture of two parts of fibrous peat to one part of loam, giving plenty of sand. Like other Ferns, it should be reproduced by means of spores.

Principal Species :—

lunulata, fronds 3' to 4'. *truncatula* (see *lunulata*).
sinuosa (see *lunulata*).

DIDYMOPANAX.

Ornamental foliage trees (*ord.* Araliaceæ) with Aralia-like leaves and flowers. They are natives of tropical South America, and require growing in a stove or intermediate house, under the same cultivation as is usually given to Aralias. (See page 67 of this work.)

Principal Species :—

Houllettii, 20', sum., grn.

DIEFFENBACHIA.

Description.—Foliage plants (*ord.* Aroidæ), with succulent stems, and large green leaves spotted and feathered with yellow, cream, or white. The flowers are inconspicuous. A large number of species are in cultivation, chiefly natives of tropical South America. If allowed to attain to their full size, they grow to a height of about 8', with the greater portion of the stem destitute of leaves. The stems contain a large quantity of juice, which is very acrid. In cultivation, the object is to get dwarf plants from 2' to 3' high, clothed with good foliage from the base upwards, which are very handsome.

Propagation.—By cuttings of leafy tops, young shoots from cut-back plants in spring, or by cutting the stems into lengths of two joints each and laying the pieces in pans of sand in a stove temperature until roots and shoots are made, then potting singly.

Soil.—Good, fibrous loam two parts, leaf mould one part, fibrous peat one part, and well-rotted manure one part, adding a liberal amount of coarse sand and charcoal.

Other Cultural Points.—A brisk, moist, stove temperature must be given to induce good colour, shading from very bright sun. Repotting will be required at frequent intervals until the final size is reached; 7" or 8" pots will be found large enough for good sized specimens, provided liquid manure

Dictyoglossum (see *Acrostichum*).
Dictyogramme (see *Gymnogramme*).
Dictyopteris (see *Polypodium*).

is given frequently after the pots are filled with roots. They make excellent exhibition plants when well grown, the large, handsome leaves having a very distinct appearance. For planting out in shady places they make excellent subjects, as they will thrive where many other plants would hardly exist. Throughout the growing period abundance of water is required, the amount being reduced during autumn and winter.

Principal Species and Varieties :—

[NOTE.—The colours refer to the leaves; all grow 2' to 3' high, taller if required.]

amabilis, grn., mottled yellowish grn.	Leopoldii, grn., wh. band.
amœna, grn., mottled wh., yel.	magnifica, grn., blotched wh.
Bausei (<i>syn.</i> picta).	picta, grn., wh. (<i>syn.</i> Bausei).
Carderi, grn., yel.	Regina, grn., yellowish grn.
Chelsonii, grn., grey band, yel. blotches.	Rex, grn., mottled wh.
gigantea, grn., mottled wh.	splendens, grn., mottled wh.
Imperator, grn., mottled yel., wh.	vittata, grn., banded wh.

Other Species and Varieties :—

haraquiniana, grn., mid-rib wh.	maculosa, grn., blotched wh.
delecta, grn., wh. spots.	majestica, grn., yel.
illustris, grn., yel. blotches.	nitida, grn., blotched yel.
insignis, grn., yel. blotches.	nobilis, grn., blotched wh.
Jenmanii, grn., wh.	Parlatorei, grh., wh.
	Seguine, grn., wh.
	Wallisii, grn., grey.

DIELYTRA.

The plants generally grown in gardens as *Dielytras* (or *Diclytras*) are now included with the *Dicentras*, and a description of them is given under that name. The popular plant known as *Dielytra spectabilis* in gardens, and popularly as the Bleeding Heart or Lyre Flower, is there dealt with.

DIERVILLA.

Description.—Hardy shrubs (*ord.* Caprifoliaceæ) from China, Japan, and North America. Many of them flower with great freedom, and are amongst the most useful shrubs in cultivation. The flowers are tubular, white, rose, red, or yellow, varying from $\frac{3}{4}$ " in length in some species to 2" in others. In addition to the species, there are many very ornamental garden varieties in cultivation. These plants are better known in gardens as *Weigelas*.

Propagation.—Cuttings of soft shoots 4" long root quickly in a warm, close propagating case in May and June.

Soil.—Rich loam is the most suitable, though almost any sort will do.

Other Cultural Points.—When well established, an occasional top-dressing with rotten manure is necessary, and during dry weather in summer copious waterings should be given. Pruning should be limited to the thinning out of worn-out flowering wood.

Principal Species :—

florida, 8', My., Je., red, wh. (<i>syns.</i> amabilis, rosea, etc.).	hortensis, 4½', sum., wh.
	japonica, 8', My., ro.

Other Species :—

amabilis (<i>see florida</i>).	rosea (<i>see florida</i>).
Lonicera, 4', sum., yel. (<i>syn.</i> trifida).	sessilifolia, 4', sum., yel.
middendorffiana, 4', sum., yel.	—splendens.

Principal Garden Varieties :—

Abel Carrière, 7', sum., ro. red.	Van Houttei, 4', wh., ro. variegata, grn., yel. lvs.
Eva Rathke, 2½', sum., red.	

DIGGING.

The breaking up and working of the surface soil, with the object of making it more fertile and improving its mechanical condition. The operation of digging differs from that of trenching in that the soil is only removed to the depth the tool penetrates, whereas in trenching the subsoil is also broken up, or brought to the surface. A spade is the best implement for digging where the soil is of a very light or sandy nature, but if stiff and retentive it breaks up better under the influence of a flat-pronged fork. Suitable times for digging are governed by the condition and character of the soil. Strong, retentive land is improved by being roughly dug in the autumn, leaving the unbroken lumps to the action of the weather. By digging again in the spring these lumps break into small particles, and a good tilth is obtained. In the case of porous and sandy soils it is better to defer the digging till the early spring. The operation should never be performed when snow is on the ground, or when the soil is too wet to work freely, as in this state it refuses to crumble, and the surface lumps dry hard. In commencing to dig an irregular, unshapely piece of ground, begin at the lowest part, unless it be on a hill, making a trench the depth and width of the spade, and removing the soil to the highest point, where a finish should be made. Insert the implement perpendicularly, and keep a broad, open trench, in the bottom of which weeds and manure should be placed. When operating on a rectangular piece of ground, many good diggers begin by dividing the area into two parts. They make a trench across the end of one half, and place the soil along the adjoining edge of the opposite half. They dig to the end, filling up the trench there with soil from across the end of the second half, and then work backwards, filling up the open trench at the finish with the soil removed at the commencement. Perennial weeds, such as Couch Grass, Thistles, and Docks, should be carefully picked out, but Groundsel, Chickweed and the like may be turned to the bottom of the trench.

DIGITALIS. (FOXGLOVE.)

Striking, and often showy, hardy perennial or biennial plants (*ord.* Scrophularinææ), best known in gardens by the handsome varieties raised from the well-known *purpurea*, the common Foxglove. Some of the true perennials are, however, very attractive, and a few hybrids have been raised between some of the species. Propagated by seeds sown in April or May in the open, and pricked off about 5" or 6" apart in a nursery bed until early autumn, when they may be planted where they are to bloom. An ordinary garden soil will suit almost all the Foxgloves, but the handsome forms of *purpurea* should have a rich one; that for the perennials may be comparatively poor and dry, as they are a little more delicate. Occasionally a curious variation is met with, the plants producing a large, campanulate flower at the top of the stem.

Dieteria (*see Aster*).

Dieterica (*see Calceoluvia*).

Diets (*see Moræa*).

Principal Species :—

ambigua, 2', Jy., yel.
A pleasing if not
showy plant (*syns.*
grandiflora and *ochro-*
leuca).

purpurea, 3' to 6', or
more, sum., pur. The
parent of a number of
beautiful vars. ranging

Other Species :—

eriostachya, 3', Jy., bien.,

br., yel.

ferruginea, 4', Jy., bien.,

br.

laciniata, 1½', Je., yel.

laevigata, 2', Jy., yel.

(*syns.* *aurea* and *in-*
tegrifolia).

from wh. to pur.,
and many beautifully
spotted. The vars.
named *gloxinioides* are
handsome. The form
campanulata has a
large flower at the top
of the stem.

lanata, 2', Je., yel.

leucophæa, 2', Je., wh.

lutea, 2', Jy., yel. (*syn.*
micrantha).

obscura, 1', Je., dull yel.

orientalis, 2', Jy., wh.

DILATRIS.

South African herbaceous plants (*ord.* *Hæmo-*
doraceæ), with narrow, rigid, Sedge-like leaves.
They require the temperature of a greenhouse.
Propagation is effected by division in spring.
Sandy loam forms a suitable soil.

Principal Species :—

corymbosa, 1', Jy., pur. *viscosa*, 9", Je. to Aug., bl.

DILL.

Anethum (now *Peucedanum*) *graveolens* ("Dill")
is a biennial herb (*ord.* *Umbelliferae*), grown for
kitchen use. The green umbels of seed and the
leaves are used for pickling in July and August,
and the leaves for flavouring soups and sauces.
The seeds should be sown as soon as ripe in Sep-
tember, or at any time between February and May,
in drills 1' apart, and the seedlings thinned to 10"
apart in the rows. Any friable garden soil in an
open situation is suitable.

DILLENNIA.

Handsome flowering trees and large shrubs (*ord.*
Dilleniaceæ) chiefly from the Malay Peninsula.
They are distinguished by shining Magnolia-
like leaves and showy yellow or white flowers.
They are rarely seen in cultivation, as they require
a great deal of room to grow to perfection. A stove
temperature is essential, and a mixture of fibrous
peat and loam suits.

Principal Species :—

indica, 30' to 40', sum., *retusa*, 40', sum., wh.
yel.

DILLWYNIA.

Pretty greenhouse shrubs from Australia (*ord.*
Leguminosæ). They usually have small, Heath-
like leaves and large numbers of small, Pea-shaped,
yellow or orange flowers, often blotched with red.
A greenhouse or frame from which frost is excluded
suits their requirements. Propagation is by
cuttings of half-ripe shoots in sandy peat in a close
propagating case in July and August. Soil, fibrous
peat to which a good quantity of coarse sand has
been added. Over-potting must be avoided, feed-
ing being better than placing in very large pots.
Very careful watering is essential to success.

Principal Species :—

cinerascens, 1' to 2', spr., *hispida*, 1' to 2', spr., or.,
yel., red. red.

ericifolia, 1' to 2', spr., *parvifolia* (*see ericifolia*).

yel., red. *speciosa* (*see ericifolia*).

floribunda, 1½', spr., yel.,
red.

DILOBA.

A genus of caterpillars which do considerable
damage to orchard fruit trees by feeding on the
leaves. The caterpillars are produced by a moth
known as the "Figure-of-Eight Moth," and are
distinguished by being green with a yellow stripe
along the back, and having a bluish head. The
moths may be caught at night with the aid of a
bright light.

DIMORPHANTHUS.

Handsome shrubs (*ord.* *Araliaceæ*), which in
favourable positions in sheltered places eventually



Photo: D. S. Fish, Edinburgh.

DIMORPHOTHECA ECKLONIS (*see p. 300*).

grow into trees, and are effective with their fine
foliage and white flowers. They are now included
under *Aralia*, which may be referred to for
treatment.

Principal Species :—

mandschuricus, 6' to 20', Aug., wh.; var. *foliis-*
variegatis (*syns.* *Aralia mandschurica* and *A.*
chinensis).

DIMORPHOTHECA.

Pretty shrubby or annual half-hardy plants
(*ord.* *Compositæ*), suitable for the greenhouse or
for bedding-out in summer. The perennials may
be propagated by cuttings struck under a glass in
a little heat in spring, and the annuals by seeds
sown under glass in heat in early spring and

Dilicaria (*see Acanthus*).

Dimaeria (*see Pelargonium*).

Dimocarpus (*in part, see Nephelium*).

Dimorpha (*of Schreber, see Eperua*).

planted out at the end of May or beginning of June. Loam and leaf mould suit.

Principal Species :—

cuneata, 3', or. (*syn.* *Arctotis glutinosa*). A pretty grh. shr.
Ecklons, 2', Jy., wh., pur. A pretty species, recently introduced (*see* p. 299).
pluvialis, 1½', Je., wh., pur. An ann. which only opens for a short time on bright days.
 — flore pleno, double, wh. A desirable bedding or border plant.

saucer of water, and near the glass in a greenhouse. It is propagated by division or by seeds.

Only Species :—

muscipula, 6", Jy., etc., wh.

DIOON.

A small genus (*ord.* Cycadaceæ) from Mexico. All the species make handsome plants, with short, thick stems crowned with a head of fifty or more long, flattened leaves. The flowers are in cones,



Photo : E. J. Wallis, Wandsworth.

DIOON EDULE.

Other Species :—

Barberæ, grh. per., pur.
chrysanthemifolia, 2', Ap., etc., grh. sub - shr., yel. (*syn.* *Calendula chrysanthemifolia*).
dentata, 2', My., yel.
fruticosa, 2', Je., grh. shr., yel., wh. (*syn.* *Calendula fruticosa*).
nudicaulis, 1½', Je., grh. sub - shr., wh., pur. (*syns.* *graminifolia* and *Calendula nudicaulis*).
Tragus, 2', My., wh., pur. (*syn.* *Calendula Tragus*).

DIONÆA. (VENUS'S FLY TRAP.)

A genus (*ord.* Droseraceæ) composed of one exceedingly interesting little insectivorous plant, that encloses insects by means of its leaves, which fold when touched. It is grown in a pot filled with live sphagnum and peat, placed in a pan or

the male cones being 9" to 12" long, the females 1" or 2" shorter. The seeds of edule are edible. The plants thrive in a stove temperature in well-drained loam.

Principal Species :—

edule, 4' to 5', lvs. 4' to 5'.
spinulosum, 3', lvs. 6' to 7'.

DIOSCOREA.

Ornamental, herbaceous or perennial, stove, greenhouse, or hardy, twining plants (*ord.* Dioscoreaceæ). They are found in South America, the East Indies, India, West Indies, China, Japan, etc., and have usually thin, twining branches, rounded leaves, whitish flowers, tuberous roots, and round, tuberous-looking growths on the branches. The tubers of several species are cooked and eaten like Potatoes, and are known as Yams. They may be increased by division of the tubers and grow well in sandy loam.

Principal Species :—

divaricata, 9', sum., wh. Chinese Yam.

Dinctus (*see* *Porana*).
Diavious (*see* *Glossary*).
Dioclea (*see* *Arnebia*).
Diomedea (*see* *Berrichia*).
Dion (*see* *Dioon*).

Other Species :—

crinita, 12', sum., wh.	refusa, 12', sum., yel.
decusneana, 12', sum., wh.	sativa, 12', sum., wh.
	Common Yam.

DIOSMA.

Greenhouse evergreen shrubs (*ord.* Rutaceæ) from South Africa. They are usually more or less Heath-like in habit. Cuttings of young shoots strike in April, and half-ripe shoots in August, in sandy peat, in a close propagating case. Fibrous peat, to which has been added a good quantity of sand, is suitable. The pots must always be well drained, and the smaller they are the better, providing the plants are not starved. Firm potting is essential. Frequent stopping is necessary, especially when young, to ensure a bushy habit. As little fire heat as possible must be given, enough to exclude frost only being wanted. The plants may be plunged out of doors during summer.

Principal Species :—

ericoides, 2' to 3', spr., wh.	Wendlandii (<i>see</i> Agathosma villosa).
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Other Species :—

alba (<i>see</i> Coleonema album).	hirsuta (<i>see</i> oppositifolia).
crenata (<i>see</i> Barosma betulina).	oppositifolia, 2' to 3', spr., wh. (<i>syns.</i> hirsuta and vulgaris).
fœtidissima (now Barosma fœtidissima).	speciosa (<i>see</i> Adenandra umbellata).
	vulgaris (<i>see</i> oppositifolia).

DIOSPYROS.

Description.—Evergreen or deciduous trees, widely distributed throughout Asia, also found in tropical Africa, North America, etc. (*ord.* Ebenaceæ). The leaves are usually more or less oval in shape, sometimes large and Magnolia-like. The flowers are not showy, and of no decorative use. Several species are very useful on account of their large, Apple-like, orange-coloured, edible fruit, and others on account of the hardness and durability of their wood. The best example of the former is the Date Plum, Kaki, and of the latter the Ceylon Ebony, Ebenum. The majority require indoor culture, but a few species are hardy. Kaki may be grown out of doors on a south wall in favoured localities.

Propagation.—Cuttings of soft young shoots may be rooted in a warm, close case in spring, or seeds sown in a stove temperature at any time. The best varieties of Kaki are grafted on stocks of the typical plant in a similar way to the Apple.

Soil.—Good fibrous loam and sand, or, if the loam is very heavy, a little fibrous peat may be added.

Other Cultural Points.—The fruiting plants should be treated in a similar manner to Apple trees in the manner of pruning; others being pruned to keep them in shape. When fruit is set, plenty of water must be given. Deciduous species are better kept on the dry side in winter.

Principal Species :—

Elenum, 40'. Ceylon	Kaki, 15' to 20', spr., grn., fruit or, yel. Japanese
Ebony.	Date Plum.
Embryopteris, 25', sum., wh.	

Other Species :—

Aurantium. Garden var. of Kaki.	Lotus, 20' to 30', Jy., hdy., red wh. European
Bertii. Garden var. of Kaki.	Date Plum.
	virginiana, 30', sum., hdy., yel., fruit or.

DIOTIS (*syn.* OTANTHUS).

A hardy herbaceous perennial (*ord.* Compositæ), with creeping rootstock, whitish, silky-looking leaves and stems, and heads of yellow flowers. It is found in South Europe, the Canaries, and occasionally in the southern parts of Britain. It is increased by division, grows readily in almost any soil, and makes a useful plant for massing in front of taller herbaceous plants.

Only Species :—

candidissima, 9' to 12'', sum., yel.

DIPCADI.

Hardy or greenhouse bulbs (*ord.* Liliaceæ), from South Europe, Africa, etc. A few species only are cultivated; they usually have a few fairly long, bright green leaves, and loose, few-flowered racemes of green or greenish yellow flowers. They are increased by division of the bulbs, and require well-drained, sandy loam. Little or no water must be given during the resting period.

Principal Species :—

Balfouri, 2' to 3', Sep., grn., yel.	serotinum, 9' to 12'', Je., br.
glaucum, 2' to 3', Aug., grn., yel.	Welwitschii, 1', Aug., grn.

DIPHYLLEIA.

A pretty, hardy, herbaceous plant (*ord.* Berberideæ), which has only two leaves and heads of white flowers, followed by blue berries. It likes a moist, peaty soil and a rather shady place. Increased by division in spring or by sowing the berries when ripe.

Principal Species :—

cymosa, 1', My., wh. Umbrella Leaf.

DIPHYSA.

Evergreen trees or shrubs (*ord.* Leguminosæ), with ornamental leaves, yellow, Pea-shaped flowers, and bladder-like fruits. Natives of tropical America. Increased by cuttings of young shoots in spring, and grown in a stove in a mixture of fibrous peat and loam.

Principal Species :—

carthagenensis, 10' to 12', sum., yel.

DIPLACUS.

Small greenhouse shrubs (*ord.* Scrophularinæ) of easy culture, and valued for their large orange and coppery red or scarlet flowers, now referred to Mimulus. Glutinosus is Mimulus glutinosus. Punicens is Mimulus glutinosus var. coccineus. The typical form has orange flowers. Propagation is effected by cuttings of half-ripened wood in sand under a bell-glass. Soil, two-thirds fibrous loam and one-third leaf mould and sand.

DIPLADENIA.

Description.—Ornamental evergreen twining plants (*ord.* Apocynaceæ) requiring the temperature of a stove. They are from South America, and are distinguished by opposite, entire leaves and clusters of very showy, white, purple, pink, rose, or crimson, tubular, wide-mouthed flowers. They may either be grown in a border and trained to the roof of a house, or grown in pots, trained on stakes or on a wire trellis or balloon. When cultivated in the latter manner they make excellent

Dipera (*see* *Disperis*).

Diphaca (*see* *Ormocarpum*).

Diphyes (*see* *Bulbophyllum*).

exhibition plants, while in the former way few plants show to better advantage. In addition to a large number of species a quantity of garden varieties are cultivated.

Propagation.—Cuttings of young shoots root readily in spring if placed in sandy peat in a warm propagating case.

Soil.—Fibrous peat two parts, fibrous loam one part, with a good amount of coarse sand and broken charcoal.

Other Cultural Points.—Beds or pots should always be supplied with a good quantity of drainage, as anything like stagnant moisture is very harmful. Repotting should be done in early spring as growth commences. After potting or planting, a day temperature of from 65° to 70° must be kept, dropping 5° at night. On all favourable occasions the syringe should be freely used. When well established plenty of water must be given throughout the summer, with frequent doses of liquid manure. Flowers are borne from May to August, and by starting later in spring a succession may be kept up until October. After the flowers are over the house may be kept a little cooler and the plants on the dry side to ensure a good rest. In mid-winter all side branches must be spurred in to within an eye or two of the old wood. When trained on trellises care must be taken to tie young shoots in before they become entangled, as they are very easily broken. Red spider is the most troublesome insect pest, and this may be kept down by a free use of the syringe.

Principal Species :—

atropurpurea, 12', sum., pur. (<i>syn.</i> <i>Echites atropurpurea</i>).	exinia, 10', sum., ro. red.
boliviensis, 9', sum., wh., yel.	Sanderi, 12', sum., ro. splendens, 12', sum., car., ro.

Other Species :—

crassinoda (<i>see</i> <i>martiana</i>).	martiana, 10', sum., ro.
illustris, 12', sum., ro. red stems, ann.	tenuifolia, 9', sum., ro. urophylla, 6', sum., flesh.

Principal Varieties :—

amabilis, 12', sum., ro. crim.	Lady Louisa Egerton, 10', sum., pk., wh., pk. eye.
ameana, 12', sum., ro., or. brearleyana, 14', sum., crim.	profusa, 12', sum., car. Regina, 10', sum., flesh. Thos. Speed, 12', sum., ro. crim., wh. throat, gold eye.
Diadem, 10', sum., pk. hybrida, 10', sum., crim. insignis, 10', sum., ro. pur.	

DIPLOCYATHA.

Succulent, Stapelia-like, greenhouse plants (*ord.* Asclepiadaceæ) with a dwarf, much-branched habit and small, curious, fleshy flowers, from South Africa. They are propagated by cuttings, and grow in fibrous loam and sand in almost equal proportions. Throughout the winter they must be kept fairly dry.

Only Species :—

ciliata, 6", sum., grn. (*syn.* *Stapelia ciliata*).

DIPLOLÆNA.

Evergreen shrubs (*ord.* Rutaceæ), from Australia, with a bushy habit. They thrive in a cool

Diplazium (*see* *Asplenium*).
Diplecthrum (*see* *Satyrion*).
Diplocalyx (*see* *Mitraria*).
Diplochita (*see* *Miconia*).
Diplocoma (*see* *Hetrotheca*).
Diploglossis (*see* *Cynanchum*).
Diplopappus (*see* *Aster*).

greenhouse, may be propagated by cuttings of half-ripe shoots in sandy peat, and should be potted firmly in sandy peat.

Principal Species :—

Dampieri, 4', Ap., wh. grandiflora, 4' to 5', My., wh.

DIPLOPELTIS.

Greenhouse evergreen sub-shrubs (*ord.* Sapindaceæ), with deeply toothed leaves. They are propagated by cuttings of young shoots in sandy soil in a propagating case, and may be grown in fibrous loam and sand.

Principal Species :—

Huegelii, 1' to 3', Jy., ro., wh.

DIPLOTHEMIUM.

Stove Palms (*ord.* Palmæ), with thick rootstocks, very short stems, elegant leaves, and minute yellowish flowers in long dense spikes. They are natives of Brazil and thrive in fibrous loam.

Principal Species :—

caudescens, 10', lvs. 4' to 5'. maritimum, 8', lvs. 2' to 5'.

DIPODIUM.

Small epiphytal Orchids (*ord.* Orchidaceæ), with tiny pseudo-bulbs. Each bulb produces one leaf 6" to 8" long. The spikes are 6" or 8" long, bearing six or eight flowers. One species only is grown; it may be grown in a stove in pots or baskets in peat, charcoal, and sphagnum.

Principal Species :—

paludosum, 6" to 8", Oct., grn., wh., pur. lines.

DIPOSIS.

Interesting botanical plants from Chili (*ord.* Umbelliferae), requiring the protection of a cold frame in winter. The flowers are small, green or white, and borne in threes, two males and a female together. Any ordinary garden soil suits.

Only Species :—

Bulbocastanum, 1', sum., wh.

DIPSACUS. (TEASEL.)

Biennial herbaceous plants (*ord.* Dipsaceæ), with hairy or prickly stems, opposite, deeply toothed leaves, and terminal heads of white, lilac, or purple flowers. The species are principally European and Himalayan. They grow readily from seeds, and thrive in almost any kind of soil. A few only are worthy of cultivation.

Principal Species :—

ferox, 3', sum., pur.	laciniatus, 6', Jy., pur.
Fullonum, 6', Jy., pur.	sylvestris, 3', sum., pur.

The old Teasel used for cloth.

DIPTERYX.

Evergreen trees (*ord.* Leguminosæ). Odorata produces the Tonga or Tonquin Bean, which is much used in perfumery. They may be increased by means of seeds or cuttings, and succeed in fibrous, well-drained loam in a stove temperature.

Principal Species :—

odorata, 60', sum., pur., sweet. Serapia is a var. of it.

Dipsacozamia (*see* *Ceratozamia*).
Dipteracanthus scandens (*see* *Asystasia scandens*).
Dipteris (*see* *Polypodium*).
Dircæa (*see* *Gesneria*).

DIRCA. (LEATHER WOOD.)

Hardy, deciduous shrubs (*ord.* Thymelæaceæ), which grow best in moist, peaty soil, and are increased by layers and seeds. The species named below is the only one in cultivation, occidentalis not being grown as yet in this country. The bark induces violent vomiting; if applied to the skin it causes irritation.

Only Cultivated Species:—

palustris, 2' to 6', Mch., yel

DISA.

Description.—Terrestrial Orchids (*ord.* Orchidaceæ) from South Africa. They are distinguished by tuberous rootstocks, leafy, succulent, annual stems, and flowers of which the sepals are usually much larger than the petals; the lower sepal is furnished with a hooded spur. Upwards of 100 species have been described, but a few only are in general cultivation, as they are very difficult to establish, especially in the neighbourhood of large towns, where the air is more or less impure. As growth commences in late autumn, and the growing season is midwinter, they do not obtain sufficient light for their requirements; this is one reason why they are so difficult to manage. A few species are grown very well in several establishments, particularly grandiflora, one of the most beautiful of all Orchids.

Propagation.—This is effected by means of offsets, and by division when growth commences.

Soil.—Fibrous peat and sphagnum in equal proportions, with a fair sprinkling of broken crocks and charcoal; if really good fibrous loam can be obtained, a little may be added.

Other Cultural Points.—Re-potting should be done early in December. The soil should be mounded well above the rim of the pot, so that the plant is lifted well up to ensure the collar being kept dry. After potting, watering must be done very carefully, until the pots are well filled with roots, after which time abundance of water is required, light syringings being given in bright weather. When the flower spikes appear, weak liquid manure may be applied. At all times a cool-bottomed stage is necessary, dry heat quickly proving fatal. After the flowers are over a decided rest must be given.

Principal Species and Varieties:—

grandiflora, 2½', Je., Jy., red, gold (<i>see figure</i>).	nervosa, 2', Je., ro.
—psittacina, yel., crim. spots.	racemosa, 1½', Je., crim., ro., yel.
—superba, sc.	tripetaloides, 1½', Je., Jy., wh., ro. spots.

Other Species:—

atropurpurea, 6", Je., pur.	incarnata, 1', Je., or. red.
cornuta, 9", win., gm., wh., pur.	lacera, 1' Je. bl.
Draconis, 1', Je., wh., pur.	pulchra, 2', Je., lil., pur.
graminifolia, 1½', Je., bl.	sagittalis, 8", Je., wh., bl.
	spathulata, 1', Je., bl.

Principal Hybrids:—

kewensis, 2', Je., Jy., ro.	Veitchii, 1½', Je., Jy., ro.
langleyensis, 1½', Jy., ro. wh.	

DISBUDDING.

In the case of fruit trees, disbudding means the removal of superfluous shoots soon after the leaves are formed. Its object is to avoid overcrowded or badly placed shoots. By a judicious

system of disbudding a waste of force is avoided, for the sap that would be otherwise expended on superfluous shoots is confined to the support of those that are left. The necessity for winter pruning is minimised, and in some cases dispensed with, by properly disbudding trees. The term disbudding is also applied to the removal of flower buds from Camellias, Chrysanthemums, and many other plants when it is desired to secure a limited number of fine blooms. In all cases where disbudding is to be practised, the operation should be performed before the buds are far advanced. In the case of Chrysanthemums, the buds may be rubbed off quite easily with the thumb or finger.

DISCARIA.

A genus of spiny, straggling shrubs (*ord.* Rhamnææ), with a few small leaves. A few are found in Australia and New Zealand, others in South America. They can be propagated by cuttings



DISA GRANDIFLORA.

in spring, and thrive in a mixture of fibrous peat and loam, to which a fair quantity of sand has been added. They require greenhouse culture.

Principal Species:—

longispina, 3', sum., wh.	Toumatou, 8', spr., wh.
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DISCHIDIA.

Curious stove, evergreen climbing or trailing plants (*ord.* Asclepiadææ), with long, thin branches emitting roots from the joints, and thick, fleshy-looking leaves. On some species the older leaves are filled with roots, which start from the stem near the base of the leaf. The flowers are very small, and not showy. They grow best in loose, sandy peat, and like a soft Fern stem to ramble over.

Disandra (*see Sibthorpia*).

Discanthera (*see Cyclanthera*).

Discanthus (*see Cyclanthus*).

Principal Species :—

bengalensis, 15' to 20', sum. rafflesiana, 10', red, thick
hirsuta, 6' to 8', red. lvs.

DISEASES.

Plants may be said to be diseased when attacked by animal or vegetable parasites, whereby the organs injured are unable to perform their proper functions, bringing about an unhealthy or morbid condition of the plant, and often its death. Gummings, or gummosis, is the result of a fungus acting upon the cellulose of the plant. Bacteria may be, and are, responsible for certain diseases. Various fungi gain an entrance into the interior of the tissue of plants, and set up incurable disease. Those fungi that appear on the surface of the leaves and other parts of plants, like the mildew of Roses and Chrysanthemums, may be destroyed by sulphur, and the plants saved. The American Blight, or Woolly Aphis, sets up a diseased condition of the cellular tissue of Apple trees, but it may be eradicated. Eelworms bring about serious diseases. Preventive measures are necessary. Various diseases are dealt with under their respective names, or under the crops they attack.

DISPERIS.

A small genus of terrestrial Orchids (*ord.* Orchidaceæ) from South Africa. They may be grown in a cool house in a mixture of fibrous loam and peat, to which has been added some small crocks and charcoal. They may be increased by division of the tubers when repotted in spring

Principal Species :—

capensis, 9", Jy., sc. secunda 9", Je., pur
cucullata, 9", Je., pur

DISPORUM.

A little grown genus (*ord.* Liliaceæ) of plants, resembling the Uvularias, and only hardy here in the south of England and Ireland. They grow best in partial shade in a border of moist, peaty soil.

Principal Species and Varieties :—

lanuginosum, 1', My., — variegatum, grn., wh.
grh., yel., grn. (*syns.* Menziesii, 1' to 3', grn.
Uvularia lanuginosa). pullum, 1½', Sep., br.
— Hookeri, 2', greenish. (*syns.* fulvum and
leschenaultianum, 1' to 2', Uvularia chinensis).
spr., wh., berries blk. — parviflorum.

DISSOTIS.

Stove shrubs (*ord.* Melastomaceæ) with prominently nerved leaves covered with fine hairs, and numerous red or purple flowers 1" across. They are readily increased by cuttings in spring, and succeed in a mixture of two parts sandy peat and one part fibrous loam.

Principal Species :—

incana, 2', sum., pur. johnstoniana, 1½', sum.,
irvingiana, 2' to 3', sum., pur.
red pur. plumosa, 2', sum., red pur.

DISTEGANTHUS.

A small genus (*ord.* Bromeliaceæ) found, like many other Bromeliads, growing in clefts on trunks of trees in moist South American forests. They require well-drained pots and a mixture of peat, charcoal, and sand, with plenty of fresh water throughout the summer.

Distlma (*see Fitzroya*).

Disemma aurantia (*see Passiflora Banksii*).

Disocactus (*see Phyllocactus*).

Principal Species :—

basilateralis, yel. scarlatinus (*see Distia-*
canthus scarlatinus).

DISTIACANTHUS.

Stove herbaceous plants (*ord.* Bromeliaceæ), answering to the same cultural treatment as the Billbergias. The leaves, which are in rosettes, have spiny margins.

Only Species :—

morrenianus, yel. (*syns.* scarlatinus, pur. red,
Cryptanthus morren- margined wh. (*syns.*
ianus and Disteganthus Bromelia scarlatina
Moensii). and Disteganthus scar-
latinus).

DISTYLIUM.

Greenhouse evergreen shrubs or small trees (*ord.* Hamamelideæ), propagated by cuttings, and thriving in a mixture of two-thirds of loam, one-third of leaf soil, and sand. They are not in general cultivation, racemosum and its variegated form being the only members of the genus met with.

DIURIS.

Stove terrestrial Orchids (*ord.* Orchidaceæ). Propagation is by division, and for soil two-thirds of leaf soil and one-third of sand are suitable; or the plants may be grown in sandy peat. The pots should be half filled with crocks.

Principal Species :—

alba, 1', Aug., wh., ro., grn., br.
pur.
maculata, 1', Mch., yel., spotted
br. pur. (*syns.* curvifolia and
pardina).
punctata, 1' to 2', bl., pur. (*syns.*
lilacina and elongata).

DOCK.

A troublesome weed, especially in rough, heavy soil. It is difficult to eradicate, as each piece of root left in the ground will make a new plant. Thorough cultivation is the only cure. Dock leaves form a cooling and soothing application for Nettle stings. For species, *see RUMEX*.

DOODIA ASPERA
CRISTATA (*see p.* 306).

DODECATHEON. (AMERICAN COWSLIP, SHOOTING STAR.)

Charming little plants (*ord.* Primulaceæ), hardy in our gardens, and admirably adapted for shady, moist nooks in the rock garden. They have pretty heads of flowers with reflexed petals. Propagation is by division in spring, or after flowering, and by seeds sown when ripe, or in spring, in pots or pans

Distrepta (*see Tecophilaea*).

Dittany (*see Dictamnus*).

Dittany of Crete (*see Oreganum*).

Dittmaria (*see Erima*).

Diri-diri (*see Casalpinia*).

Dodder (*see Cuscuta*).



in a cold frame. Soil, light sandy peat, kept moist. *Clevelandii* likes a dry soil.

Principal Species and Varieties :—

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| <p><i>Meadia</i>, 1½', Ap., My., ro. pur., wh., or., lil. Almost all the Dodecatheons in cultivation have been referred to this species. It varies much in colour from seed, but for convenience the following well-marked vars. are described :—</p> <p>— <i>Clevelandii</i>, 1', My., vio., bl.</p> <p>— <i>elegans</i>, 1', more numerous and deeper</p> | <p>coloured flowers than the type.</p> <p>— <i>frigidum</i>, 9'', a form with deep - coloured, non-drooping blooms.</p> <p>— <i>giganteum</i>, 1½', earlier and taller than the type (<i>syn. macrocarpum</i>).</p> <p>— <i>integrifolium</i>, 6', My., ro. crim.</p> <p>— <i>lanceifolium</i>, 1½', lvs. narrower than the type, flowers ro. with yel. at base (<i>syn. Jeffreyi</i> or <i>jeffreyanum</i>).</p> |
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DOLICHOS.

A large but horticulturally unimportant genus (*ord. Leguminosæ*). Some of its members are shrubs, others trees, and some are herbs. Most of them have twining stems. Propagation, by seeds and by cuttings in brisk heat for the stove forms; in a cool frame for the half-hardy species.

Principal Species :—

Lablab, 1', Jy., grh., ro. pur. (*syns. lignosus*, *purpureus*, and *Lablab vulgaris*).

DOLIOCARPUS (*syn. OTHLIS*).

Climbing shrubs (*ord. Dilleniaceæ*) with showy but poisonous fruits. Tips of the young shoots root quickly if inserted in sandy soil in bottom heat in spring. Soil, equal parts of peat and loam, with sand and a few pieces of charcoal.



Photo: Cassell & Company, Ltd.

DOODIA CAUDATA MULTIFIDA (see p. 306).

A number of named Dodecatheons are now offered, good varieties being James Cooke, Lemoinei, Longfellow, and Rosy Gem.

DOG'S TOOTH VIOLET (see *ERYTHRONIUM*).

- Dog Rose* (see *Rosa canina*).
Dog Violet (see *Viola canina*).
Dogberry Tree (see *Cornus sanguinea*).
Dog's Bane (see *Apocynum*).
Dog's Cabbage (see *Thelygonum*).
Dogwood (see *Cornus*).
Dogwood, Jamaica (see *Piscidia*).
Dogwood, Swamp (see *Ptelea trifoliata*).
Dogwood, Victorian (see *Prostanthera*).

Only Cultivated Species :—

Calinea, Ap., st., wh.

DOMBEYA.

Stove evergreen trees and shrubs (*ord. Sterculiaceæ*), propagated by cuttings of firm shoots in sand in bottom heat in spring. They like a compost of two-thirds of loam and one-third of peat, with sand. *Astrapea* and *Ossonina* are included by botanists in this genus, which it seems probable may give rise to a race of showy garden

Dolichandra (see *Marfadyena*).

Dolichoderia (see *Achimenes*).

Dombeya (of *La Marek*, see *Araucaria*).

Dombeya (of *L'Heritier*, see *Tourretia*).

plants. Cayeuxii is the first hybrid that has been raised.

Principal Species :—

acutangula, 10', red (*syns.* *angulata* and *Astrapæa tilæfolia*).
Burgessiae, 10', Aug., Dec., wh., blotched ro., showy.
cannabina (*syn.* *Astrapæa viscosa*).

Cayeuxii, pk., a hybrid between (*Astrapæa*) *Mastersii* and *Wallichii*.
ferruginea, 15', wh.
Mastersii, wh., fragrant.
viburniflora, 15', Feb., wh.

DOODIA.

A genus of pretty greenhouse Ferns (*ord.* Filices). They are easily raised from spores, sown when ripe, and placed in a cool, close frame. They like a compost of two parts of good loam, one part of

Other Species and Varieties :—

blechnoides, 15" to 18". . . *kunthiana*.
dives, 1'. . . *lunulata* (*see media*).

DOREMA.

Hardy herbaceous perennials (*ord.* Umbelliferae), easily increased by seeds sown when ripe, and doing well in any ordinary garden soil. *Ammoniacum*, 7', June, white, produces the Gum Ammoniac of commerce. It is of no value in decorative gardening.

DORONICUM. (LEOPARD'S BANE.)

Showy spring- and summer-flowering hardy perennial plants (*ord.* Compositae) of much service for beds and borders; valuable for planting by the side of water, or in moist, shady places; propa-



DORONICUM CAUCASICUM.

leaf mould, and sand. Plenty of water must be given at all times. Doodias are easy to grow, and the rose and claret coloured tinting of the young fronds in *aspera* and *media* and their varieties is a great attraction.

Principal Species and Varieties :—

aspera, 6" to 8".
 — *corymbifera*, 6" to 15", crested.
 — *cristata* (*see p.* 304).
 — *multifida*, 6" to 18", forked, claret coloured when young.
caudata, 6" to 12", terminal pinna very long.
 — *confluens* (*syn.* *linearis*) is sometimes seen.

— *harryana*, more vigorous.
 — *multifida*, frond tips crested (*see p.* 305).
media, 1' to 1½', very vigorous (*syn.* *lunulata*). There are several vars., of which *Brackenridgii*, *connexa*, *duriuseula*, *Milnei*, and *Moorei* are the best.

gated by division in spring or early autumn. Any good garden soil, well manured, will do.

Principal Species :—

austriacum, 1' to 1½', Meh., yel. A valuable early-blooming plant.
caucasicum, 1', Ap., yel. Resembles preceding, but has solitary flowers (*see figure*).

plantagineum, 3', Meh., yel. A capital border plant, which gives flowers far into aut.
 — *excelsum*, 5' (*syn.* *Harpur Crewe*), superior to the type.

Other Species :—

Columnæ, 6", Ap., yel.
dentatum, 1', My., yel.
macrophyllum, 2', Jy., yel.

Pardalianches, 2', My., yel.
scorpioides, 1', My., yel.

DORSTENIA.

Curious plants (*ord.* Urticaceae), with green flowers on a flat, leafy receptacle. They are of easy

Donax (*see Arundo*).

Donia (of G. Don, *see Clianthus*).

Donia (of R. Brown, *see Grindelia*).

Dorcoceras (*see Bava*).

Doria (of Adanson, *see Solidago*).

Doria (of Lessing, *see Othonna*).

culture in a moist stove heat. Propagation is by root division in spring, before growth begins; also by seeds sown on a hotbed in spring. Soil, equal parts of loam and leaf soil, with sand.

Principal Species :—

argentina, lvs. dark grn., with broad silvery central band.

Other Species :—

bowmaniana, 6", lvs. dark grn., blotched wh. grn., wh. (*syn.* maculata).
Contrajerva, 6", lvs. Mannii, Nov.; curius. tubicina, 3", Aug.; rare.

DORYANTHES.

Greenhouse plants (*ord.* Amaryllidæ), of noble appearance. They are increased by suckers, which are given off freely by the old plants. Loam and leaf soil in equal proportions, with sand, make a suitable compost. From the great height of the flower stems they can only be grown in roomy houses.

Principal Species :—

excelsa, 8' to 16', sum., sc. Palmeri, 8' to 16', sum.,
Guilfoylei, 16', sum., crim. red.

DORYCNium.

Hardy herbs or sub-shrubs (*ord.* Leguminosæ), raised from seeds sown in spring, preferably in gentle heat. Any good garden soil. Dorycniums are capital subjects for dry, rather poverty-stricken places.

Principal Species :—

suffruticosum, 2' to 3', Je., wh. (*syn.* Lotus Dorycnium of Linnaeus).

Other Species :—

herbaceum, 1½', Jy., wh. latifolium, 1' to 2', Je., wh.
hirsutum, 1' to 2', Jy., wh. rectum, 2', Je., ro. (*syn.*
or pk.; hairy. Lotus rectus).

DORYOPTERIS (see PTERIS).

DOSSINIA.

A genus (*ord.* Orchidaceæ), close to Anæctochilus, but differing in the shape of the column. Marmorata is usually met with under the name of Anæctochilus Lowii (*syn.* Cheirostylis marmorata), and answers to the same treatment as the other Anæctochilus.

DOUBLE FLOWERS.

Doubling in flowers may arise in a variety of ways. Frequently the petals are multiplied at the expense of the stamens and pistil, as in the case of the Camellia and the Stock. At other times multiplication of petals may be produced through a breaking up of the originals. The true double flower being thus deprived of the organs of reproduction is unable to set seed; but as compensation for this it remains in beauty for a longer time than the "single" would have done. This fact, in addition to its increased showiness, has caused double flowers to be much sought after and admired.

The causes which induce "doubling" are various, and rather subtle. In the case of Stocks, a starving process seems to be the contributing cause. Kerria japonica, on the other hand, exhibits a tendency to become double under cultivation, so that lack and excess of nutrition have both to be reckoned with. Perhaps the most frequent cause is the

stimulus of high cultivation, and it may be noticed in the cases of Begonias, Carnations, Balsams, and other popular races of garden flowers, that any deterioration in the quality of the cultivation tends to reduce the completeness of the doubling. Thus, in the case of double Begonias that are required to set seed, a starving process for a few weeks is necessary.

Careful selection year after year plays an important part in the fixing of the double strain, and even then there is always a percentage of reversions to the original singles; witness the garden Stock.

The great family of Composites contribute a special section of so-called "double" flowers. Thus single and double Pyrethrums and Chrysanthemums are spoken of, but in these instances, and in many more that might be named, what passes muster as a "petal" is really a flower, and the doubleness or otherwise of the bloom depends upon the number of "flowers" packed into one "head." The long (female) "ray" florets are commonly multiplied at the expense of the shorter (male) florets of the disc. In the Anemone-flowered section we have a great number of disc florets, forming a central cushion, and two or three rows of guard ray (ligulate) florets.

DOUGLASIA.

Pretty, rare little plants for the rock garden (*ord.* Primulacæ), and resembling the Androsaces. They like a compost of peat, loam, and grit, and require a covering of glass to protect them from damp in winter. Propagation, by seeds or division in spring. Vitaliana is referred to in Androsace, by which name it is generally known in gardens.

Principal Species :—

laevigata, 1½', spr., aut., vitaliana (*syns.* Androsace
ro., pk. vitaliana and Aretia
nivalis, 3', Je., pur. vitaliana).

DOWNINGIA.

Beautiful hardy annuals (*ord.* Campanulacæ), with charmingly coloured flowers, suitable for borders or for pots, and raised from seeds sown in a frame in March or in the open in May.

Principal Species :—

elegans, 6", Jy., bl., wh. wh., yel. Suitable for
(*syn.* Clintonia elegans). hanging baskets (*syn.*
pulchella, 6", Jy., bl., Clintonia pulchella).

DRABA. (WHITLOW GRASS.)

Most attractive little rock plants (*ord.* Cruciferae), which produce a charming effect in sunny positions in spring. They generally form dwarf tufts of foliage covered with bloom. Unfortunately the confusion which exists in their nomenclature in gardens is almost hopeless, and it is well-nigh impossible to procure more than a few species correctly named from nurseries. Propagation is by seeds sown in a frame or greenhouse in spring, or by careful division of the perennials. The former is preferable. Gritty soil, with sandy peat, suits. The species all require a sunny position, and many look extremely well jammed in between the crevices of the rock garden.

Principal Species :—

aizoides, 3", Meh., yel.; pyrenaica, 2½", My., wh.,
a pretty little plant. pur. The "Rock
Aizoon, 3'. Ap., yel. (*syn.* Beauty," a charming
lasiocarpa). plant, also known as
Mawii, 2", spr., wh.; Petrocallis pyrenaica.
a charming little species.

Doryophora (see Colorado Beetle).

Dove Flower (see Peristeria).

Other Species :—

alpina, 3", Ap., yel. (*syn.*
glacialis).
aurea, 6", My., bien., yel.
bryoides, 4", Mch., yel.
cinerea, 4", Mch., wh.
corymbosa, 3", My., wh.
cuspidata, 2", Mch., yel.
fladruzensis, 1", Ap., wh.
(*syn.* nivalis of De Can-
dolle).

hispida, 3", Aug., yel.
(*syn.* tridentata).
incana, 6", My., ann.,
wh. (*syn.* contorta).
olympica, 4", Je., yel.
(*syn.* bruniefolia).
stellata, 6", Je., wh.
tomentosa, 4", Je., wh.

DRACÆNA.

Description.—Stove plants (*ord.* Liliaceæ), with very richly coloured and prettily variegated foliage.

close pit and frequently syringed, but given little water at the roots. They soon break into growth at the nodes, and the shoots may be taken off and inserted as cuttings. A "heel" of the old wood facilitates rooting. One cutting in a thumb pot is the best plan. The process of "ringing" is a safe and easy method of rooting the tops. A notch is cut just below a joint under the leaves, a narrow ring of bark is removed, or a tongue about $\frac{1}{2}$ " long is cut through the joint in the same way as when layering Carnations, a small wooden peg being inserted to keep the tongue from closing. The wound is bound round with moss, which is kept moist. In a few weeks, young



DRACÆNA AUSTRALIS LENTIGINOSA RUSSELLII (*see* p. 309).

They are closely allied to the genus Cordyline, with which they are commonly confused. Most of the Dracænas of gardens are in reality Cordylines, but they are referred to here, for garden purposes. The difference between the two genera is chiefly in the character of the fruits, there being generally but one ovule in Dracæna, and many ovules in Cordyline. Dracænas are amongst the most useful of our foliage plants; there are many handsome varieties of terminalis (correctly Cordyline terminalis) alone. Many of them are suitable for subtropical bedding, and one species, australis (correctly Cordyline australis), is nearly hardy. As a matter of fact, it is hardy in a considerable portion of Ireland; also in the island of Arran, and on the west coast of Ross-shire, near Poolewe.

Propagation.—By cuttings of the stem, by eyes, and by layers. Cuttings root readily at all times of the year, although spring is the best. A close, warm frame is necessary, and if the cuttings can be plunged in bottom heat, so much the better. After the top has been taken off, the old stumps should be kept in a

roots will have pushed into the moss, and the cutting may be safely severed from the parent plant and potted up. Sorts with thick, succulent stems, such as Lindenii and massangeana (really forms of fragrans), may be expeditiously increased by cutting the stems of the old plants up into lengths, one eye in each length. The "eyes" root and grow quickly if placed under the same conditions as the cuttings. The root buds, or "toes," as they are commonly called, are often found upon old plants. All that is necessary is to cut them off and pot them. They are not unlike Lily of the Valley crowns in appearance.

Soil.—Good loam two parts, chopped up or pulled to pieces, and old Mushroom bed refuse one part, with a sprinkling of coarse sand, for established plants. Equal parts of loam and leaf soil, with sand, form a suitable mixture for young plants.

Other Cultural Points.—Dracænas do not need large pots, and undue exuberance of growth must be restrained by firm potting. Small pots, firm potting, a light position near the glass, a temperature of not less than 60° F., and plenty of water

both overhead and at the root are the needful conditions to produce the neat, elegant plants so much in request for table decoration. *Sanderiana* is naturally "leggy," and this must be corrected by frequent propagation; moreover, old plants are not so well variegated as young ones. Mealy bug and thrips are the chief insect enemies, but they ought not to be allowed a footing, seeing that the big leaves permit of the free use of the sponge. Sponging with skimmed milk will impart a greater glossiness to the foliage. When employed in dwelling rooms the plants should be taken out each day and syringed thoroughly. No *Dracæna* ought to be kept in a dwelling room for more than a fortnight; a week is often too much. They do not like draughts.

Principal Species and Varieties :—

[Many of these are really members of the genus *Cordylina*, but the popular mind refuses to call them anything but *Dracenas*. Bearing this in mind, and also with a view to save space, they are placed here. The claims of many forms in the subjoined lists to specific rank are very vague. Numbers are mere varieties of the versatile *terminalis*, which has long been cultivated in the Tropics.]

albicans, st., lvs. grn., wh. bordered.
amabilis, st., lvs. pk., wh., grn., 24" to 30" long by 5" wide.
australis, 10' to 50', lvs. 2' to 3' long, 2" to 4" wide, sub-hdy., flowers sweet scented (*syn. indivisa* of Regel).
argenteo-striata, lvs. grn., striped wh.
Doucetii, lvs. 2' to 3' long, 1" to 1" wide, st., grn., wh. (*syn. indivisa doucetiana*).
lentiginosa, lvs. 2' to 3' long, 1" to 1" wide, grh., pur.; the form *Russellii* is handsome (*see p. 308*).
lineata, grh.
Rigoutsii, st., wh., grn. (*syn. Rigoutsii*).
rubra, grh., lvs. bronzy grn., flushed ro.
Russellii, grh., lvs. br., yel. midrib.
variegata, grh., grn., wh.
Baptistii, lvs. 1½' to 2' long, st., grn., yel. pk. bicolor, 5', lvs. 4" to 6" long, 2" to 3" wide, st. *cannæfolia*, lvs. 1' to 3' long, 1½" to 4" wide, st., grn.; a var. of *terminalis*.
Chelsonii, st., dark grn., mottled crim.
Cooperi, lvs. 2' to 3' long, 1½" to 4" wide, st., bronzy pur.
Draco, Dragon Tree, 60', grh., grn., a huge tree. *fragens*, 6', st., grn., flowers fragrant.
Lindenii, lvs. 1' to 2' long, 1½" to 3½" wide, st., yel., grn.; one of the most valuable decorative *Dracenas*.

— *massangeana*, much like *Lindenii*, but the colours are wh. and grn., st.
godeffiana, lvs. 3" long, 2½" wide, grn., mottled wh. like an *Aucuba*, stems thin and wiry.
goldieana, lvs. 6" to 9" long, 5" to 6" wide, st., grn., br., wh.; very pretty and useful.
Guilfoylei, lvs. 1½' to 2' long, st., wh., grn., pk.; a var. of *terminalis*.
indivisa, lvs. 2' to 4', grh., grn.
atropurpurea, grh., dark pur.
lineata, lvs. 4" wide, grh., grn., pk.
Veitchii, grn., with red ribs.
indivisa (of Regel, *see australis*).
indivisa verna, lvs. very leathery, 2' to 5' long, 2" to 4" wide, grh., grn., with yel. midribs (*syns. indivisa and aureo-lineata*).
magnifica, lvs. 1½' to 2' long, 6" to 10" wide, st., bronzy pur.; a var. of *terminalis*.
marginata, lvs. 1' to 2' long, 6" to 9" wide, grh., st., grn., very tough (*syn. gracilis*).
Rex, lvs. 1' long, st., bronzy grn.
sanderiana, 1' to 5', st., wh., margined grn.; a handsome plant which is at its best when young.
splendens, st., bronzy grn., margined carmine.
stricta, 6' to 10', lvs. 1½' to 2' long, 1" to 1½" wide, grh., grn.

— *congesta*, grh., broader leaves than type.

terminalis, 10' to 12', st., colours variable.
Weismannii, st., red, wh.

Other Species and Varieties :—

albo-rosea, st., grn., ro., red; a var. of *terminalis*.
amboynensis, st., ro., car.
angusta, st., bronzy grn.
arborea, 40', st.
Banksii, 5' to 10', lvs. 5' to 6' long, grh., grn.
erythrorachis, grh., grn., red midribs.
Bartetii, st., bronzy red; a garden var.
bellula, st., pur., red; a var. of *terminalis*.
Broomfieldii, st., wh., grn.
cernua (*see reflexa*).
Claudia, st., bronzy grn., flaked crim.
concinna, 6', st., grn., margined pur., red.
congesta (*see stricta congesta*).
cuprea, st., metallic grn.; a var. of *terminalis*.
Dennisonii, st., bronzy pur.
Doucetii (*see australis Doucetii*).
Duffii, st., crim.
elliptica, 2' to 3', st., grn.
maculata, st., lvs. spotted yel.
excelsa, st., bronzy grn., crim.; a form of *arborea*.
floribunda, 6' to 8', lvs. 3' to 4' long.
gloriosa, st., grn., bronzy or. (*syn. Shepherdii*); a var. of *terminalis*.
gracilis (*see marginata*).
hookeriana, lvs. 2' to 4' long, st., grn., bordered wh. (*syn. Rumphii*).
latifolia, broader lvs. than type.

imperialis, st., metallic grn.; a var. of *terminalis*.
inscripta, st., grn., striped wh.; a var. of *terminalis*.
Laingii, st., grn., margined crim., wh.; a handsome hybrid.
macrantha (now *Brocchinia cordylinoides*).
madagascariensis, st., grn.; a pretty var.
metallica, st., bronzy pk., pur. petioles; a var. of *terminalis*.
mirabilis, st., bronzy grn., margined crim.
norwoodensis, st., grn., yel., crim.
ornata, bronzy grn., margined ro. pk.
parviflorum, lvs. 6" to 8", st., grn., spotted yel.
pulchella, st., red; a var. of *terminalis*.
reflexa, 12' to 15', st., grn. (*syns. cernua, salicifolia*).
robinsoniana, st., bronzy grn., crim.
Rumphii (*see hookeriana*).
salicifolia (*see reflexa*).
Suposchnikowii, 10' to 15', st., grn.; sub-arboreal.
Smithii, 15', lvs. 3' to 4' long, st., grn.; close to *fragens*.
triumphans, st., blk., pur.
umbraculifera, 10' to 15', lvs. 2' to 3', st., grn.
Williamsii, st., grn., striped chocolate, ro., yel.
Youngii, st., grn., striped red.

DRACOCEPHALUM. (DRAGON'S HEAD.)

Pretty border plants (*ord. Labiatae*), which are valued for their rather singular flowers. The best are hardy perennial plants, but a few annuals are worth growing, though little seen. The annuals and perennials are propagated by seeds, sown in a frame or greenhouse in spring; the latter also by division in spring. Light, rich garden soil is best. Slugs must be kept from some of the species; they are particularly fond of *grandiflorum*.

Principal Species :—

austriacum, 1½', Jy., bl.; an ornamental border plant.
grandiflorum, 6", Jy., bl.; a charming Alpine (*syn. altaicense*).

japonicum, 2', bl., wh.
ruyschianum, 2', Jc., pur. (*syn. arguense*).
speciosum, 1½', Jc., pur.

Other Species :—

Moldavica, 1½', Jy., ann., bl.
albiflorum, wh.
mutans, 1', Jy., bl.
origanoides, 6", Jy., hlf-hdy. trailer.
palmatum, 1½', Jy., pur.

parviflorum, 6", Jy., ann., pur. (*syn. peregrinum*).
pinnatum, 1½', Jc., bl.
Ruprechtii, 1½', Jy., bl.
thymiflorum, 6", Jy., ann., pur.
virginianum (*see Physostegia virginiana*).

DRACONTIUM.

Curious stove plants (*ord.* Aroidæ), with thick, fleshy rhizomes and much hooded spathes, and exhaling a very strong and disagreeable odour. The stems of the leaves are usually much mottled and barred, generally with some shade of purple or brown. The plants answer to the same cultural treatment as *Amorphophallus*, but they are of little horticultural value.

Principal Species :—

asperum, 5' to 6', pur., elatum and *Amorpho-*
mottled wh. (*syn.* phallus *nivosus*).
Carden, 3'.

Other Species :—

elatum (*see asperum*). *gigas*, 10'', spathe bluish
fœcundum, 4' to 5'. Mch. br.
spathe br. without, polyphyllum, 2', Dec.
lurid pur. within.

DRACOPHYLLUM.

Greenhouse hard-wooded plants (*ord.* Epacridæ) of rather straggling habit, but considerable beauty. They may be propagated by tips of the young shoots, taken whenever they can be had, dibbled into pure sand, placed in a gentle heat, and covered with a bell-glass. The glass should be removed every day, and wiped dry, or many of the cuttings will damp. Afterwards, firm potting in rather small pots is desirable. Occasional pinching is necessary. For soil, a mixture of two-thirds of sandy peat and one-third of finely chopped loam, with a few small pieces of charcoal, is suitable. The most useful species is *gracile*. This, on account of the great length of its fine, whip-like branches, is often trained to pyramid or balloon shapes. The untrained plants furnish cut flowers in plenty. After flowering, the plants should be cut back rather hard, and kept closer than usual to favour fresh growth. Plenty of water must be given at all times.

Principal Species :—

capitatum, 1½' to 2', sum., *gracile*, 2', Je., Jy., wh.,
wh. fragrant, especially in
the evening (*see figure*).

DRACUNCULUS.

Singular half-hardy plants (*ord.* Aroidæ) resembling the *Arum*. They are tuberous-rooted, and require a rather rich, but not heavy, soil. Propagated by division of the rhizomes.

Principal Species :—

creticus (*see vulgaris*). (*syn.* *Arum Dracun-*
vulgaris, 1½', Je., pur. br. culus).

DRAINAGE.

Unproductive soils have been made fertile, and many others have had their productiveness increased, by drainage. Drainage prevents stagnant water, and the chemical action it sets up, which is so injurious to most vegetation; by carrying off superfluous water it dries and simultaneously warms the soil, enabling seeds to be earlier sown and the produce to be sooner gathered; it also ensures aëration of the soil, which not only means increased fertility, but greater ease in working. Open ditches were probably the earliest forms of drains; and these still have a place on large farms and fens. The general practice now is to cut

drains or trenches in the direction of the greatest fall of the land, and others of smaller dimensions to conduct the water to them. The depth varies with the condition of the land from 2' 9" to 4' 6", and in boggy land as deep as 7'. In the smaller channels cylindrical drain tiles 2" in diameter and 15" long are placed end to end, and no collars are now considered necessary; over the tiles a layer of broken stones may be laid, and over these inverted turves to prevent the fine soil from clogging the drains. The distance the drains are apart must vary with the amount of water to be conducted from the land; 15' to 18' is a generally suitable interval. A drain may be made with stones alone, placing the largest at the bottom; faggots will



DRACOPHYLLUM GRACILE.

also serve the purpose, but for permanence and effectiveness nothing surpasses drain tiles. The free growth of moss and "Horsetails" (*Equisetum*) generally indicates badly drained land.

DRAKÆA.

A small genus of Australian plants (*ord.* Orchidacæ) that will grow in a cool house in a mixture of peat, loam, and sand. The best known species, *elastica*, produces a spike 1½' high surmounted by a mottled flower, which in shape and poise resembles an insect in flight.

DRAWN.

Plants become drawn when placed so closely together as to be deprived of light and air from all sides; they then elongate unduly in search of these essentials. The condition is favoured by injudicious ventilation.

DREPANOCARPUS.

A genus (*ord.* Leguminosæ) consisting of several species, *lunatus*, which grows 10' high and produces

Dracopsis (*see Rudbeckia*).

Dragon, *Green* (*Arisæma Dracontium*).

Dragon Tree (*see Dracaena Drawn*).

Dragon's Head (*see Dracocephalum*).

white flowers, being the chief. It is a stove evergreen, and should be placed in a mixture of fibrous peat and loam, with sand to ensure porosity. Propagation is by cuttings of half-ripened wood inserted in sand beneath a bell-glass over bottom heat.

DRESSING.

This term is applied to the trimming up of plants by the removal of dead leaves, flowers, and seed pods, and to the loosening of the surface soil of borders and beds to give them a neat, tidy appearance. It is sometimes applied to the surface dressings on Asparagus beds and in Strawberry and Raspberry quarters; this is top-dressing or mulching. The term is in vogue amongst exhibitors of Chrysanthemums, Roses, Carnations, and other flowers, who, after manipulating the petals or florets, so as to place them in the shape and position required, with ivory tweezers, speak of the blooms as "dressed."

DRILL.

To admit of quick surface cultivation, and also to ensure a certain amount of room to each plant, garden and farm seeds are almost always now sown in drills or shallow trenches. The general method of drawing drills is to stretch a line along the desired site, and, using it as a guide, make the drills, by means of a hoe, shallow or deep to accommodate fine or large seeds. By means of a rake-like instrument with adjustable, coulter-shaped teeth, several drills may be drawn at once. The ingenious little American machine known as the Planet Junior Cultivator is used as a hoe, but is also fitted with adjustable coulters for making drills at various depths and widths.

DRIMIA.

Interesting little bulbous plants (*ord.* Liliaceæ) allied to the Lachenalias. Although not of striking colours, they are of pleasing appearance. They are grown in the greenhouse in pots filled with sandy loam and peat or leaf soil. When at rest they must be kept almost dry, and repotted when growth begins to show. Propagated by offsets.

Principal Species :—

<i>giliaris</i> , 1½', Aug., pur., wh.	<i>media</i> , Aug., wh.
<i>elata</i> , 2'', Oct., red, grn.	<i>purpurascens</i> , 6'', Aug., pur.
<i>haworthioides</i> , 6'', grn.	<i>pusilla</i> , 4'', My., grn.

DRIMIOPSIS.

Greenhouse bulbs (*ord.* Liliaceæ) which bear a considerable resemblance to the Drimias, and require similar cultivation. The two following, although seldom seen, are in cultivation, and are the best of those which have been introduced.

Principal Species :—

<i>Kirkii</i> , 9'', Jy., wh.	<i>maculata</i> , 1', wh.
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DRIMYS.

This small genus (*ord.* Magnoliaceæ) has some economic value, as *Winteri* provides the Winter's Bark of commerce, which resembles Cinnamon, and is sometimes used for it. This bark is said to be good in cases of scurvy. They are evergreen half-hardy trees, and will thrive out of doors in

favoured localities, but are safer in the greenhouse. Propagation is by cuttings in sand under a bell-glass over gentle bottom heat. A compost of fibrous peat, lumpy loam, and sand suits.

Principal Species :—

<i>aromatica</i> , 12', Ap., wh., pk. (<i>syn.</i> <i>Tasmannia aromatica</i>).	<i>Winteri</i> , 30', My., wh. (<i>syn.</i> <i>chilensis</i>).
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DROSERA. (SUNDEW.)

Interesting and curious insectivorous plants (*ord.* Droseraceæ). Beautiful as are our native species, *Anglica*, *intermedia*, and *rotundifolia*, when examined, they are rivalled by the exotics. Our own are hardy, but, like the exotic species, do well in a greenhouse. Propagation is by seeds, or by division of the crowns. Root cuttings of *binata* laid on sandy peat, covered with similar soil, and then with a bell-glass, will form plants if kept moist. Soil, peat and live sphagnum, the plants being placed in some of the latter on the top of the pots.

Principal Species and Varieties :—

<i>binata</i> , 6'', Je., wh.; a pretty per. (<i>syn.</i> <i>dichotoma</i>).	<i>peltata</i> , 1', wh.; an Australian am. — <i>foliosa</i> , wh.
<i>filiformis</i> , 1', Jy., pur.; a pretty North American per. (<i>syn.</i> <i>tenuifolia</i>).	— <i>gracile</i> , pk.
	<i>rotundifolia</i> , 4'', Jy., wh.; a charming native.

Other Species :—

<i>acaulis</i> , 3'', Jy., wh.	<i>linearis</i> , 4'', Jy., wh., pur.
<i>Anglica</i> , 3'', Jy., wh., red.	<i>longifolia</i> , 3'', Jy., wh.
<i>capensis</i> , 6'', Jy., pur. (<i>see p.</i> 312).	<i>pauciflora</i> , 3'', Jy., wh.
<i>cistifolia</i> , 1', red, vio., wh.	<i>spathulata</i> , 3'', Jy., pur.
<i>gigantea</i> , Jy., wh.	<i>Whittakeri</i> , wh.
<i>intermedia</i> , 3'', Jy., wh., red.	

DROSOPHYLLUM.

The only species of the genus, *lusitanicum* (*ord.* Droseraceæ) is a greenhouse plant 1' high, which produces its pretty yellow flowers in late spring. Propagation is by seeds, and the plant grows best in light loam and sand; it must never be heavily watered. Viscid drops gather upon the leaves, and flies which alight thereon cannot escape; their juices are absorbed by the leaves as in other carnivorous plants.

DRYANDRA.

This genus (*ord.* Proteaceæ) comprises a considerable number of species, few of which have received much attention from horticulturists. All are greenhouse evergreen shrubs that thrive in fibrous peat and loam, with sand and charcoal to ensure porosity; the drainage must be perfect. Propagation is by cuttings in sand beneath a bell-glass over gentle bottom heat; they must be transferred from the cutting pots immediately they are rooted.

Principal Species :—

<i>calophylla</i> , 2', Je., yel.; elegant lvs.	<i>floribunda</i> , 3', Je., yel.
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DRYAS.

Very beautiful dwarf shrubby plants (*ord.* Rosaceæ), perfectly hardy in moist, peaty soil, and attractive in the lower portions of the rockery, or

Drepania (*see Tulpis*).

Drejera (*see Jacobinia*).

Dryas Plant (*see Thapsia garganica*).

Droopwort (*see Spiraea Filipendula and Potentilla Filipendula*).

Drummondia (*see Mitella*).

at the edge of a bog garden. If on a rather dry place, *Drummondii* must have a little shade, but *octopetala* can do with more sun. For the latter, peaty loam and sand are best. They are propagated by division and by seeds sown in spring; also by cuttings under a hand-light or a bell-glass.

Principal Species :—

<i>Drummondii</i> , Je., yel.	<i>octopetala</i> , Je., wh. ;
<i>integrifolia</i> , Je., wh. ;	trailer.
trailer (<i>syn. tenella</i>).	— <i>lanata</i> , woolly lvs.
	— <i>minima</i> , small form.

DRYMODA.

Only one species of this Malayan genus (*ord. Orchidaceæ*) appears to be known. It is a small-growing stove Orchid that does best when fixed upon a block of wood with a little sphagnum about its roots.

Only Species :—

picta, 3", Mch., grn., pur.

DRYMOGLOSSUM.

A small genus (*ord. Filices*) of low-growing stove Ferns that are increased by division, and thrive in a mixture of peat and loam.

Principal Species :—

<i>carnosum</i> .	<i>piloselloides</i> .
— <i>subcordatum</i> .	<i>rigidum</i> .

DRYMONIA.

A genus (*ord. Gesneraceæ*) of stove evergreen climbers. The plants do best in mellow loam. Cuttings root in very sandy soil beneath a bell-glass over bottom heat. *Punctata* and *villosa* are now referred to *Episcia*.

Principal Species :—

<i>cristata</i> , 4', Aug., grn.	<i>serrulata</i> , 6', aut., pur.
<i>marmorata</i> , 6', Je., yel.,	(<i>syn. bicolor</i>).
pk.	

DRYMOPLHÆUS.

A small genus (*ord. Palmæ*) of handsome Palms that require good loam and a stove temperature. Propagation is by seeds.

Principal Species :—

<i>appendiculatus</i> , 30'.	<i>singaporensis</i> (<i>see Pty-</i>
<i>ceramensis</i> , 30'.	<i>choraphis singaporensis</i>).
<i>leprosus</i> (<i>syns. olivæ-</i>	
<i>formis</i> and <i>Rumphii</i>).	

DRYNARIA (*see POLYPODIUM*).

DRYOBALANOPS.

The principal species, *aromatica* (*ord. Dipterocarpeæ*), is a stove evergreen tree that thrives in rich, mellow loam. Propagation is by seeds. The tree is indigenous to Sumatra and has great economic value, inasmuch as it provides a vast proportion of the natural camphor.

DRYOPTERIS (*see PTERIS*).

DRYOSTACHYUM.

A small genus (*ord. Filices*) of Ferns that thrive best in the stove. They are closely allied to the *Drynaria* section of *Polypodium*, and referred to that genus by botanists. Increase is by division, and the plants do well in a mixture of loam and peat.

Principal Species :—

<i>caudatum</i> .	<i>pilosum</i> .	<i>splendens</i> .
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DRYPETES (*see XYLOSMA*).

DRYPIS.

A dwarf growing hardy evergreen (*ord. Caryophyllæ*). Propagation is by seeds when procurable, and by cuttings inserted under a hand-light in the early summer. A mixture of loam, peat, and sand suits, and a dry situation must be afforded.

Only Species :—

spinosa, 9", Je., bl.

DRY ROT.

Most fungi need a fair amount of moisture to ensure development, but there are two or three



DROSERA CAPENSIS (*see p. 311*).

species which prefer drier conditions. The dry-rot fungus attacks dry timber and so works among the wood cells that the tissues presently crumble up like dust. Roof beams are sometimes attacked, and as their collapse might mean loss of life, as well as property, they should be occasionally examined, especially in very old structures and when any curvature is noticed. Good ventilation, dressing the timber with creosote before use, and washing with corrosive sublimate are preventives and remedies.

DUBOISIA.

Australian plants (*ord. Solanaceæ*) of shrubby habit, and needing greenhouse protection. Loam, peat, and sand form a suitable compost, and propagation is effected by cuttings. The white, funnel-shaped flowers are produced in axillary clusters.

Only Cultivated Species :—

<i>Hopwoodii</i> .	<i>Leichardtii</i> .
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Duania (*see Homalanthus*).

Duchekia (*see Palisota*).

Duckola (*see Omphalea*).

Duck's Foot (*see Podophyllum*).

Duhamelia (*see Hamelia*).

DUMASIA.

This small genus (*ord.* Leguminosæ) comprises evergreen twiners which flourish in the greenhouse. The best soil consists of fibrous loam and sandy peat, and propagation may be by seeds sown over slight heat; or by cuttings of moderately firm growths in very sandy soil beneath a bell-glass over gentle heat.

Principal Species :—

pubescens (*see villosa*). *villosa*, 6', aut., yel.

DUNG.

This general title is recognised as including all animal excrement valuable for increasing the fertility of land, but usually it has more particular reference to farmyard and stable manure. Though farmyard manure varies in value with the nature of the food and litter given to the animals, it is about the best that can be employed, as it returns the constituents of plant food to the soil, though not all of them in sufficient quantities. Too often, farmyard and stable manures are allowed to accumulate in the open, where wind and rain rapidly dissipate a most valuable constituent, ammonia; such manure heaps should always be under a roof and so situated that the drainings from them, and the cowshed, may be thrown on to them occasionally to keep the mass moist. A covering of gypsum will also prevent the loss of ammonia. Horse or stable manure ferments rapidly and is warmer than cow manure, but unless turned regularly and kept nicely moist it soon loses its value as a fertiliser. Lime may be added to fresh manure to fix the ammonia, but not to decayed manure.

Sheep manure contains rather more nitrogen and phosphoric acid than horse droppings, but it decomposes slowly; it is useful on some soils, but is somewhat lacking in potash. Pig manure is extremely rich, but as it decomposes slowly it is best mixed with stable or farmyard manure. Cow manure alone is cooling in its effects, and is most valuable when mixed with water and applied to growing crops; when dried and powdered it also forms an excellent ingredient in potting soils for strong-rooting subjects.

Poultry excrement is technically known as a "strong" manure, because it contains a great deal of nitrogen in the readily assimilated form of uric acid. Some absorbent, like peat, dry earth, or leaf mould, should be mixed with poultry manure so that its valuable properties may be retained until needed. Stored in this way and subsequently passed through a sieve, poultry manure makes a famous top-dressing for growing crops. Natural guano, the accumulation, through long ages, of the excrement of sea birds, is more highly concentrated and valuable than poultry manure, but similarly it is a highly nitrogenous fertiliser. Human excrement, generally known as night soil, is not so much used as formerly, owing to the increased sanitation and sewage works, and the absence of earth closets. Night soil is nevertheless a most valuable manure to deal with. It needs to be covered with dry earth, both to prevent odour and to retain volatile substances.

As dung becomes converted into humus it increases the water-holding capacity of the soil, consequently unless drainage and cultivation are of the best it tends to reduce the soil temperature,

Dumerilla (*of Lagasca, see Jungia*).

but the advantages that result during the warmest part of the year outbalance the disadvantages. Long, green dung assists in keeping stiff soils open, whereas short, decomposed dung tends to consolidate light soils and make them more retentive of moisture.

DURANTA.

This is a genus (*ord.* Verbenacæ) of blue-flowered greenhouse evergreen shrubs. There are several species, but they have no great measure of popularity. Propagation is by cuttings in sand beneath a bell-glass over bottom heat, and a mixture of equal parts of peat and loam is a suitable soil.

Principal Species :—

Plumieri, 15', Oct., bl. — *alba*, wh., fruit amber.
(*spus. dentata*, *Ellisia*, *stenostachya*, 10', Oct.,
inermis, and *xalapensis*). bl.

DURIO.

An evergreen tree (*ord.* Malvacæ). The fruit is the celebrated Durian. It should be grown in loam and leaf mould, in the stove. Propagation is by spring cuttings in sand beneath a bell-glass over bottom heat.

Principal Species :—

zibethinus, 50', My., wh.

DUVALIA.

These South African succulent plants (*ord.* Asclepiadæ) differ from the better known *Stapelias* in floral structure, but require precisely similar treatment in a warm greenhouse.

Principal Species :—

Corderoyi, 4", Aug., grn., *glomerata*, 4", Aug., br.
pur., br. *hirtella*, 6", Aug., br.
elegans, 4", Aug., pur. *radiata*, 4", Aug., pur.

DYCKIA.

Dyckias (*ord.* Bromeliacæ) are like small Pine-apple plants. They are increased by suckers, and should be grown in the greenhouse in a mixture of light loam, sand, and mortar rubbish. Afford perfect drainage, and water judiciously in winter.

Principal Species :—

altissima, 2', Sep., yel. *frigida*, 1½', Feb., or.
brevifolia, Aug., yel. *rariflora*, 2', Je., or.

DYPSIS.

This is a genus of Palms (*ord.* Palmæ) from Madagascar, that must be grown in the stove. They require sound loam, and may be propagated from seeds.

Principal Species :—

Hildebrandtii. *madagascariensis*.

EARINA.

A group of eight or nine species (*ord.* Orchidacæ) from New Zealand and the Pacific Islands. They are all of small growth, and are best managed in a stove, suspended in shallow baskets, and planted in fibrous peat and sphagnum. Stock is

Duretia (*see Brehmeria*).
Dutchman's Pipe (*see Aristolochia Siphon*).
Durania (*see Schinus*).
Dureroia (*see Adhatoda*).
Dyssodia (*see Dysodia*).
Eagle Fern (*see Pteris aquilina*).
Eagle Wood (*see Aquilaria*).

readily increased by division at the commencement of the growing season.

Principal Species :—

macronata, My., wh. *suaveolens*, My., wh.

EARTH.

Indispensable to the growth of most plants. It consists of admixtures of lime, sand, and clay, with decayed vegetable matter called humus. A knowledge of the chemical composition of these earths is useful in determining the kind of manure necessary to ensure complete fertility. Clays generally possess a great deal of potash; sandy earths much iron; lime-containing soils are rich in phosphates. All of these, while insoluble in a dry state, are readily rendered soluble and available for plant foods when mixed with water. (See also SOILS.)

EARTHING-UP.

The term employed by gardeners to denote the drawing of soil up to and around the stems of certain plants, either as a protection against cold or to accomplish the blanching of the parts, as in the case of Celery and Cardoons. The soil used should be just moist, free from lumps and stones, and when used for blanching purposes care should be taken to prevent it finding its way into the hearts of the plants. For details see the various plants affected.

EARWIG.

So well known is this insect (*Forficula auricularia*) that description is unnecessary. To gardeners who have much wall fruit under their care, or who grow large stocks of Dahlias, Carnations, and Chrysanthemums, the earwig is too often an enemy. Hollow stems of Sunflower, Jerusalem Artichoke, and Broad Bean placed among the foliage of the subjects mentioned act as traps, for in these the insects lurk during the daytime, and from them they are easily discharged into a vessel of hot water. Small pots partly filled with dry moss and inverted on the stakes supporting Dahlias and other plants are also good traps.

EBENUS.

Neat little shrubby or herbaceous plants (*ord.* Leguminosæ), of which only two species appear to be in cultivation. These are scarcely hardy with us, and should be grown in a cool greenhouse, Alpine house, or frame. They like a light soil, and are increased by seeds sown in spring, the shrubby species being also increased by cuttings under glass.

Only Cultivated Species :—

cretica, 1½', Je., hlf.-bdy. shr., pk. (*syn.* *Anthyllis cretica*).

Sibthorpii, 6", Je., herbaceous, pk.

EBERMAIERA.

A genus (*ord.* *Acanthaceæ*) of herbs that require a stove temperature. Cuttings of half-ripened growths inserted in very sandy soil beneath a bell-glass over bottom heat root readily. A mixture of three parts fibrous loam and one part peat, with coarse sand, suits.

Earlia (see *Graptophyllum*).

Earth-nut (see *Arachis hypogæa*).

East Indian Hawthorn (see *Rhaphiolepis indica*).

East Indian Wine Palm (see *Phoenix sylvestris*).

Principal Species :—

nitida, 4", wh.

ECCREMOCARPUS.

Elegant climbing plants (*ord.* *Bignoniaceæ*) with pretty flowers and foliage, and of much value for the conservatory, or for walls and trellises in summer. Scaber is hardy in sheltered localities, but is best treated as a half-hardy annual, by sowing the seeds in heat in early spring and planting the seedlings out in May. Cuttings may also be taken in autumn and struck under glass. The other species should be treated as greenhouse plants, and propagated by seeds or cuttings. All like a light, rich soil.

Principal Species :—

longiflorus, 8', Jy., yel. — *roseus*, reddish flowers.

scaber, 8', Jy., or. (*syn.*

Calampelis scaber).

ECHEVERIA.

Succulent plants (*ord.* *Crassulaceæ*), now included with the *Cotyledons*, but best known in gardens by the present name. They are valuable for carpet bedding, and also for the greenhouse or window. Propagated by offsets; by seeds sown in heat in spring; or by leaves pulled off and laid in dry sand in pots in a warm house in autumn. A dry, but rich, sandy soil suits.

Principal Species and Varieties :—

<i>gibbiflora</i> , 1½', Jy., yel.,	<i>glauca</i> , 6", Jy., sc., yel.
red (see <i>Cotyledon gibbiflora</i>).	<i>retusa</i> , 1½', Nov., yel.
— <i>metallica</i> , very fine.	— <i>glauca</i> .
— <i>pumila</i> , 6", Aug., yel.,	— <i>floribunda splendens</i> .
red.	<i>secunda</i> , 1', Je., red, yel.
	— <i>glauca</i> .
	— <i>glauca major</i> .

Other Species :—

<i>atropurpurea</i> , 9", Sep.,	<i>lurida</i> , 6", Sep., red.
red.	<i>rosea</i> , 1', Ap., red, yel.
<i>californica</i> , 9", Sep., yel.	<i>Peacockii</i> , 1', Jy., red.
<i>fulgens</i> , 6", win., red yel.	<i>stolonifera</i> , 6", yel., pk.

ECHIDNOPSIS.

A genus (*ord.* *Asclepiadææ*) of greenhouse succulents that grow satisfactorily in light loam and brick rubbish, but need liquid manure when in active growth. Water carefully, especially during the resting period. Propagated by spring cuttings dried at the base before insertion in sandy soil.

Principal Species :—

cereiformis, 8", sum., yel.

ECHINACEA.

According to present authorities, the *Echinaceæ* (*ord.* *Compositæ*) should be separated from the *Rudbeckias*, although they are generally known in gardens by the latter name. For convenience the species now called *Echinaceæ* are named herewith, but cultural details will be found under *Rudbeckia*. Some new forms of various colours are now being offered.

Principal Species :—

<i>angustifolia</i> , 3', Aug., red.	<i>purpurea</i> , 2½', Aug., red
<i>Dicksonii</i> , 1', Aug., hlf-hdy., lil.	pur. (<i>syn.</i> <i>intermedia</i>).

ECHINOCACTUS.

A large genus (*ord.* *Cactææ*), of which the nomenclature is somewhat confusing, owing to

Ebony (see *Diospyros Ebenum*).

Echidnium (see *Dracontium*).

distinctive names having been given to what were simply slight seedling variations. The plants thrive in a greenhouse with a warm, humid atmosphere in summer, and cool and dry in winter, when it is necessary to apply water with the greatest care. Soil, light loam and brick rubbish.

Principal Species :—

- | | |
|--------------------------------------------------|---------------------------------------|
| cinnabarinus, 8'', sum., red. | Joadii, yel. |
| concinus, Mch., yel. | leeanus, My., pale yel. |
| coptocognus, Ap., My., wh., striped pur. | multiflorus, Je., wh. |
| corynodes, Oct., yel. | Orcuttii, 2' to 3', crim., fruit grn. |
| gibbosus, 6'', aut., wh. | rhodophthalmus, Aug., crim. |
| — nobilis, 2', Jy., wh. | Scopa, Ap., yel. |
| Grusonii, 6'', red, yel. | — cristatus, crested. |
| Haselbergii, Ap., yel., red. | streptocaulon, 1½', Aug., yel. |
| ingens, aut., yel., pk. (<i>syn. Visnaga</i>). | |

Other Species :—

- | | |
|-------------------------------------------------------|-----------------------------|
| centetarius, Jy., yel. | Haynii, Aug., red. |
| chlorophthalmus, Je., pur. | hexadrophorus, Je., wh. |
| Cumingii, Jy., yel. | Pfeifferi, Jy., yel. |
| exsulptus, Jy., wh. | tenuispinus, Jy., pale yel. |
| hamatocanthus, Jy., yel. (<i>syn. longhamatus</i>). | |

ECHINOPS. (GLOBE THISTLE.)

Striking hardy perennial or biennial plants (*ord. Compositæ*). They are good bee plants. They are easily raised from seeds sown in spring in fine soil, and are also propagated by division in spring or autumn. A rich loam is advisable.

Principal Species and Varieties :—

- | | |
|--------------------------------------|----------------------------------------------------------------|
| bannaticus, 2', Jy., bien., bl. | tenuifolius. |
| — albus, wh. | spherocephalus, 4', Jy., pale bl. (<i>syn. paniculatus</i>). |
| Ritro, 3' Jy., bl.; one of the best. | — albus, wh. |
| | — glabratus. |

Other Species :—

- | | |
|----------------------------------------------------|--------------------------------------------------|
| alaburicus, 3', Aug., bl. | humilis, 1½', Jy., bl. |
| exaltatus, 6', Jy., wh. | persicus, 2', Aug., wh. (<i>syn. pungens</i>). |
| glaberrimus, Aug., bl. | strigosus, bl. |
| Gmelini, Jy., wh., bl. | Tournefortii. |
| græcus, 2½', Jy., bl. (<i>syn. lanuginosus</i>). | |

ECHINOPSIS.

Although this genus (*ord. Cactæe*) is now included by some botanists with *Cereus*, it represents such a distinct group as to render it worthy of a short note in a popular horticultural work such as this. The members of it like an open mixture of good fibrous loam and small pieces of sandstone, well-drained pots, a good supply of water in summer, and little or none in winter. They succeed best in full sun.

Principal Species and Varieties :—

- | | |
|-------------------------------------------------------------------|------------------------------------------------|
| campylacantha, 1' to 1½', Jy., ro., yel. stamens. | Eyriesii, 6'', Jy., wh., fragrant, long tubed. |
| cristata, 1½', Jy., creamy wh., 6'' across (<i>see figure</i>). | — flore pleno. |
| — purpurea, ro. | — glauca. |
| decasneana, 1', Jy., wh., yel. tinge. | Pentlandii, 6'', Jy., wh., outer petals red. |
| | tubiflora, 6'', sum., wh. |

Echinanthus (*see Echinops*).

Echinocereus (*see Cereus*).

Echinoglossum (*see Cleistostoma*).

Echinostachys (*of Brongniart, see Echea*).

Echinostachys (*of E. Meyer, see Pycnostachys*).

Echioides (*see Nomia*).

Echiopsis (*see Lobostemon*).

ECHITES.

A genus of stove and greenhouse evergreen climbers (*ord. Apocynaceæ*), many of which are very beautiful. They flourish in mellow, fibrous loam and peat, with sharp sand to ensure porosity. Propagated by cuttings in sand beneath a bell-glass, with bottom heat for the stove species.

Principal Species :—

- paniculata, 9', Jy., st., yel.

Other Species :—

- stellaris, 10', Jy., st., yel., ro. umbellata, 15', Jy., st., yel.



ECHINOPSIS CRISTATA (OR CEREUS CRISTATUS).

ECHIUM. (VIPER'S BUGLOSS.)

A genus comprising a number of plants (*ord. Boraginæ*). They are of annual, biennial, or perennial duration, and herbaceous or shrubby in habit. They grow in common soil, and are increased by seeds, division, or, in the case of shrubby species, by cuttings or layers. The general appearance of the flowers is indicated by those of vulgaris, the native Viper's Bugloss. Only a few are named as representing the genus.

Principal Species :—

- | | |
|-------------------------------------------------------|-------------------------------------------------------------------------|
| albicans, 1', Je., hdy. per., vio. | lusitanicum, 3', Jy., hdy. per., wh., bl. (<i>syn. salamanticum</i>). |
| callithyrsum, 6' to 8', sum., bl. | plantagineum, 3', Je., hlf. hdy. ann. or bien., vio. |
| caudicans, 3', grh. bien., ro. (<i>see p. 317</i>). | rubrum, 1' to 2', My., bien., red, vio. |
| creticum, 1½', Jy., hdy. ann., vio. | violaceum, 3', Je., bien., vio. |
| fastuosum, 3', My., grh. ev., deep bl. | vulgare, 3', Je., bien., vio. |

EDELWEISS. (LEONTOPODIUM ALPINCUM.)

A pretty, white-leaved "Everlasting" plant (*ord.* Composite), erroneously considered difficult to grow, and prized because of its association with Switzerland. It grows readily from seeds, sown under glass in spring, the young plants being placed on a dry, sunny rockery when large enough to handle. The Edelweiss is quite hardy, but may suffer in rainy districts unless a sheet of glass be placed over it to keep off winter rains. It likes a light soil. It grows about 6" high, and has yellow flowers surrounded by white bracts.

EDGEWORTHIA.

A small genus (*ord.* Thymelæaceæ). The plants do well in a cool greenhouse in a compost of sandy peat and loam over perfect drainage. Cuttings of half-ripened wood in sand root, though not freely. An abundance of water is required in summer, but the supply must be considerably reduced in winter.

Only Species :—

chrysantha, 3', Ap., Je., yel.; sweet (*syn.* Gardneri).

EDGING.

The edges of lawns should be carefully cut with the long-handled edging shears each time the grass is mown, and all cuttings carefully gathered up, or a troublesome crop of grass weeds will soon appear. The "edging-iron" is a crescent-shaped steel blade fixed to a long cross handle. It is used for removing irregular portions of grass edgings to beds or walks, and cutting out new beds on grass. It should be sharpened with a rubber or file, and carefully cleaned after use to prevent rusting.

EDGINGS.

Edgings may be roughly divided into two classes, viz. living and dead. The former are greatly favoured because of their fresh and natural appearance, but have three great drawbacks: (1) They generally require much care in clipping to keep them tidy, and frequent replanting to fill blanks; (2) they serve as harbours to slugs, earwigs, and other foes of the gardener; (3) they prevent the use of weed-killing compounds on any walks which they may be employed to border.

Dead edgings, on the other hand, are durable, do not harbour vermin to the same extent as live ones, and, if formed of undressed stone, cannot well be objected to on the score of unnaturalness.

There is a wide choice of subjects for use in either section. Taking living edges first, we have suitable for the flower garden, Box; Ivy; Periwinkle; *Gentiana acanlis*; the Thrift (*Armeria vulgaris*); London Pride (*Saxifraga umbrosa*); various Saxifrages of the mossy section, such as muscoides, hypnoides, and cæspitosa; Euonymuses, of which perhaps radicans, argenteus variegatus, and latifolius aureus marginatus are the best; the common Houseleek; Stonecrops; Arabises; Aubrietias; Helianthemums; Hypericum calycinum; and Lysimachia Nummularia aurea.

The choice of dead edgings must depend largely upon the financial resources at command. One of the most effective, and also most expensive, is formed of the rope twist pattern tile. The cheapest is perhaps that formed of split deal battens.

EGG PLANT.

In France, under the name of Aubergine, the Egg Plant (*Solanum Melongena*—the elongated forms are known as *S. esculentum* and the ovoid ones as *S. ovigerum*) is more largely cultivated than in this country, and the egg-shaped or elongated fruits are served in many ways as a vegetable. Here, however, we cultivate the several forms chiefly as ornamental plants. Sow seeds in heat early in February, and pot the seedlings singly in rich soil; 6" or 7" pots are large enough to fruit the plants in. Syringe freely and afford liquid manure as soon as the fruits commence to swell. In the summer a warm position out of doors will suit them, but even during that period they are best managed in a greenhouse. The ovoid forms are not so successful from a culinary point of view as the longer ones.

A Selection of Varieties :—

Early Dwarf Purple.
New York Purple.

Suttons' Long Purple.
White.

EGLANTINE.

This is a poetic title applied somewhat indiscriminately to rambling species of Rose or Rubus, though as a general rule it is used to denote the fragrant Sweetbrier, and was so used by Shakespeare. Milton calls Honeysuckle "Eglantine." Latterly the name has been given to Rubus Eglantaria, a white-flowered Australian species.

EHRETIA.

A genus (*ord.* Boraginæ) of greenhouse and stove evergreen shrubs and trees that flourish in equal parts of peat and loam. Increase is by cuttings in spring in sandy soil beneath a bell-glass over bottom heat.

Principal Species :—

acuminata, 11', Jy., grh., wh.

EICHORNEA.

A small genus (*ord.* Pontederiaceæ) of aquatics that flourish in a tank in the stove, and may be increased by division of the rhizomes in the spring.

Principal Species :—

azurea, 1', sum., yel. bl. speciosa, 1½', sum., bl. (*syn.* Pontederia crassipes).

EKEBERGIA.

A small genus (*ord.* Meliaceæ). Capensis, an evergreen tree, grows well in fibrous loam, peat, and sand, and may be propagated from cuttings of ripe wood in very sandy soil beneath a bell-glass over gentle bottom heat.

Principal Species :—

capensis, Je., Jy., wh.

Echtrus (*see* *Argemone*).

Eckardia (*see* *Peristeria*).

Edraianthus (*in part, see* *Wahlenbergia*).

Edraianthus serpyllifolius (*now* *Campanula serpyllifolia*).

Edwardsia (*of* *Salisbury, see* *Sophora*).

Eel Fern (*see* *Acrostichum Herminieri*).

Eel Grass (*see* *Vallisneria spiralis*).

Egenolphia (*see* *Acrostichum*).

Egeria (*see* *Elodea*).

Egyptian Bean (*see* *Nelumbium speciosum*).

Egyptian Lotus (*see* *Nymphaea Lotus*).

Egyptian Paper Reed (*see* *Papyrus antiquorum*).

Egyptian Rose (*see* *Scabiosa arvensis*).

Egyptian Thorn (*see* *Acacia arabica*).

ELÆAGNUS. (WILD OLIVE. OLEASTER.)

Remarkably pretty evergreen or deciduous trees or shrubs (*ord.* Elæagnaceæ), all, except a few greenhouse species which are of little value, being hardy. The foliage is pleasing, and the white or yellow flowers are succeeded by pretty berries. The hardy species are grown from cuttings in the open in autumn, or from seeds sown in spring. The greenhouse species are not here named, and the undernoted are hardy.

Principal Species :—

angustifolia, 20', My., yel. : a handsome tree (<i>syn.</i> hortensis).	above and silvery beneath (<i>syn.</i> longipes, crispa, edulis, etc.).
multiflora, 3' : a pretty shr., or. fruits, lvs. grn.	pungens, 6', yel., ev. : lvs. silvery below.

Other Species :—

argentea, 10', Jy., yel. (<i>syn.</i> Shepherdia argentea of gardens).	macrophylla, 6', aut., yel. orientalis, resembles angustifolia.
glabra, 6', Aug., wh. (<i>syn.</i> tenuiflora).	umbellata, Jy., wh. (<i>syn.</i> latifolia of gardens).

ELÆIS.

A genus (*ord.* Palmæ) of handsome stove Palms that thrive in sound loam and sand. Propagated by seeds and suckers. An excellent wine is made from these plants, while guineensis and melanococca provide the valuable Palm oil that is used in soap making. The several species range from 30' to 50' high.

Principal Species :—

guineensis.	occidentalis.	spectabilis.
melanococca.	pernambucana.	

ELÆOCARPUS.

A genus (*ord.* Tiliaceæ) of greenhouse evergreen shrubs and trees. Propagated by seeds, when procurable, and by cuttings of ripe wood with the leaves attached, in very sandy soil beneath a bell-glass over bottom heat. Soil, three parts loam and one part fibrous peat.

Principal Species :—

cyaneus, 10', Jy., grh., wh. (<i>syn.</i> reticulatus).	grandiflorus, 20', Jy., st., crim., wh. serratus, 20', Jy., st., wh.
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ELÆODENDRON.

A genus (*ord.* Celastrineæ) of greenhouse and stove evergreens, amenable to the same cultural conditions as Elæocarpus, *which see.*

Principal Species :—

australe, 3', Jy., grh., wh., grn.	croceum, 30', Je., wh., grh. glaucum, 6', Je., st., grn.
capense, 18', Je., grh., grn.	orientale, 15', Jy., st., greenish yel.

ELDER (*see also* SAMBUCUS).

The common Elder, *Sambucus nigra*, is a British shrub or small tree, and is conspicuously beautiful, both when covered with its flat panicles of creamy white flowers, and when laden with black fruits. Though not fastidious as to soil, the Elder prefers a light rooting medium that is moderately moist during summer. Its berries are extensively used in country districts for wine-making, and the flowers are used in the manufacture of cosmetics, and also for flavouring. There are several varietal forms of *nigra* of value for effect in shrubberies

Elaphoglossum (*see* *Acrostichum*).

Elater (*see* *Wireworms*).

Elateriopsis (*see* *Cyclanthera*).

and plantations; the golden *foliis aureis* and the silvery *variegata* are particularly telling, but all are useful. There are also white and green berried varieties, while another species, *racemosa*, produces large, scarlet berries. All the Elders are easily propagated by cuttings or layers, but care should always be taken to remove the buds in the portion below ground, or the plants will spread beyond bounds.

ELETTARIA.

The members of this East Indian genus (*ord.* Scitamineæ) require a stove temperature, plenty of



Photo: Cassell & Company, Ltd.

ECHIAM CANDICANS (*see* p. 315).

moisture when growing freely, and a rich loam to root in. They are closely allied to the Alpinias.

Principal Species :—

Cardamomum, 8', Aug., grn., wh., furnishes the Cardamoms of commerce.

Other Species :—

costata, 6', Jy., red (now Amomum costatum).	linguiformis, 5', Aug., yel., red.
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ELEUSINE.

A small genus (*ord.* Gramineæ) of beautiful, half-hardy Grasses that find favour, in a dried state, for winter decorations. They will grow in light soil, and may be raised from seeds.

Elecampane (*see* *Inula Helenium*).

Electrospina (*see* *Eriocaulon*).

Elephant's Apple (*see* *Feronia Elephantum*).

Elephant's Foot (*see* *Testudinaria*).

Elephantoxia (*see* *Phytelephas*).

Principal Species :—
barcinonensis, 9", Sep., ann.

ELISENA.

A small genus (*ord.* Amaryllidæ) of handsome greenhouse bulbs. Propagated by offsets in sandy loam. Soil, light loam of good quality, with a generous admixture of sand.

Principal Species :—
longipetala, 2', My., wh.

ELISMA.

(*Ord.* Alismacæ.) This is the proper name of *Alisma natans*, a pretty little water plant, very suitable for growing in shallow water outdoors or in the tank inside. It is hardy, and is increased by division or by seeds.

Only Species :—
natans, Jy., wh.

ELLIOTTIA.

A small genus (*ord.* Ericacæ) of dwarf evergreens. They do best in the greenhouse, but will thrive out of doors in very favoured localities. A compost of loam, peat, and sand is suitable. Propagated by spring cuttings beneath a bell-glass or by layering in summer.

Principal Species :—
racemosa, 2', Je., wh.

ELM (see also ULMUS).

As a park tree, the English Elm (*Ulmus campestris*) is in its right place. It is handsome when in full leaf, rich in colour during late autumn, and a decided ornament even when the leaves have fallen. As an avenue tree the common Elm is sometimes dangerous, for its huge, leafy branches occasionally snap off suddenly in hot weather, without any apparent cause. When planted in suitable positions, Elms live to a great age, and may reach a height of 100'. The wood is tough, and used in boat building, wheel making, and for coffins. Some well-marked varieties are even more ornamental than the type, and of these *antarctica aurea*, *pendula*, and *variegata* are among the best. The Scotch or Wych Elm (*U. montana*) is a fine garden tree, and is well represented by such varietal forms as the Parsley Elm (*U. m. crispa*); the upright, large-leaved *U. m. Dovæi*; the golden form known horticulturally as *U. m. Dampieri aurea*, or *Wredei aurea*; the Camperdown Elm (*U. m. pendula*); and the Purple-leaved Elm (*U. m. purpurea*). Seedlings of both English and Scotch Elms are extensively used in forestry.

ELYMUS.

A genus (*ord.* Graminæ) of hardy Grasses. They will grow in any soil, and may be increased by seeds or by division. The species vary in height from 1' to 5'. *Arenarius*, the Lyme Grass, is used for binding sandy soil on embankments. *Canadensis*, *giganteus*, *sibiricus*, and *vaginatus* are sometimes found in cultivation.

EMBELIA.

A small genus (*ord.* Myrsinæ) of stove evergreens, grown for their foliage and berries. Equal

Elk Nut (see *Pyrolaria oleifera*).

Elf's Horn Fern (see *Platynerium*).

Ellobocarpus (see *Ceratopteris*) (*Ex. E. oleraceus* = *C. thalictroides*).

Elodea (of Spach, see *Hypericum*).

Embanma (see *Pterisanthes*).

parts of loam and peat suit. Propagated by cuttings of half-ripened wood in sand beneath a bell-glass over bottom heat. The berries of *E. Ribes* are edible, though somewhat pungent.

Principal Species :—

Ribes, 20', Je., grn., wh.

EMBOTHRIUM.

Several species were formerly included in this genus (*ord.* Proteacæ), but the majority have been removed. The principal remaining species is the beautiful *coccineum*, a greenhouse evergreen shrub. In favoured places in Devon and Cornwall it grows out of doors. Propagated by seeds. A compost of three parts fibrous peat and one part fibrous loam, with coarse sand, suits this South American plant.

Principal Species :—

coccineum, 20', My., Je., sc.

EMILIA.

Pretty annual or perennial plants (*ord.* Compositæ) of which only a few may be named. These are half-hardy annuals, which are useful for the border or for cut bloom. They require the ordinary treatment of flowers of their class, and may either be sown under glass in March, or in the border, where they are to bloom, in May.

Principal Species :—

flammea, 2', Jy., sc. (*syn.* *Cacalia coccinea*).

sonchifolia, 2', Jy., pur. (*syn.* *Cacalia sonchifolia*).

EMMENANTHE.

A Californian genus (*ord.* Hydrophyllacæ) needing greenhouse protection.

Principal Species :—

penduliflora, 2', Jy., yel., pendulous flowers.

EMPETRUM. (CROWBERRY or CRAKE-BERRY.)

Neat little evergreen, Heath-like shrubs (*ord.* Empetracæ), with pink or reddish flowers, followed by black or red berries, and growing well in a damp spot filled with peaty soil. They are propagated by cuttings in summer, inserted in sandy soil under a bell-glass or hand-light, or by seeds sown in spring or autumn. These germinate very slowly.

Only Species :—

nigrum, 9", My., pk., — scoticum, dwarf.
berries blk. — rubrum, red berries.

EMPLEURUM.

There is only one species of note in this genus (*ord.* Diosmæ). It is an evergreen shrub that must be grown in the greenhouse, and may be increased by cuttings of the tips of the growths inserted in very sandy peat beneath a bell-glass. A good compost consists of fibrous loam two parts, peat one part, and enough sharp sand to ensure porosity.

Principal Species :—

serrulatum, 3', Je., pk.

ENCELIA.

A genus (*ord.* Compositæ) of greenhouse evergreens that thrive in fibrous loam, peat, and sand.

Emblica (see *Phyllanthus*).

Emericia (see *Vallisneria*).

Enphytus (see *Rose Saxifraga*).

Empodium (see *Curculigo*).

Propagated by cuttings in very sandy soil beneath a bell-glass, carefully shaded.

Principal Species :—

canescens, 15", Jy., or. halimifolia, 15", Jy., yel.

ENCEPHALARTOS.

A genus (*ord.* Cycadaceæ) of very handsome foliage plants that are exceedingly valuable for adorning our stoves and intermediate houses in association with other plants. Propagated by scales. The plants flourish in a mellow loam. All the species are from South Africa. The inflorescence is a cone. This genus is especially interesting as being among the last representatives of an ancient flora. It forms, as it were, a link between the prehistoric past and the present in plant life.

Principal Species :—

Altensteinii, 8'. horridus, 6' (*syn.* Zamia
(*aff.* *syn.* *caffra*). horrida).
Hildebrandtii, 8'. villosus, 4'.

Other Species :—

cycadifolius. Ghellinckii. Verschaffeltii.
elongatus. regalis.

ENDIVE.

A hardy plant, *Cichorium Endivia* (*ord.* Compositæ), chiefly cultivated for salad purposes, though the broad-leaved or Batavian Endive is sometimes cooked as a vegetable.

Propagation.—From seeds. To ensure a regular supply, the first sowing should be made outdoors the second week in April, followed by successional sowings about every fortnight through the summer. For late autumn, winter, and spring supplies seeds should be sown in August and September, preferably on a south border.

Soil.—Any ordinary garden soil, which has been deeply dug and made moderately rich by the addition of manure, is suitable.

Other Cultural Points.—When plants are allowed to remain in the seed drills the latter should be 18" asunder for the broad-leaved varieties, and the plants thinned to 15" apart. The curled varieties are not so robust in growth, and 1' apart all ways will suffice for them. It is advisable to transplant a few from the seed rows, as these, being a week or two later, are useful for succession. Some form of protection is necessary in the case of plants required for winter and early spring use. The simplest method is to lift the plants in October with good balls of earth attached, and place them close together in a cool house or cold frame. Give air on all favourable occasions, and protect from frost.

Blanching.—For salad purposes it is necessary to have the heads thoroughly blanched. Various methods are adopted, and in the summer and autumn there is none better than loosely tying up the outer leaves, allowing room for the expansion of the young growth, or it might rot. Blanching may also be effected by laying tiles or slates on the plants, but this is not advised in a wet season, as the leaves are liable to decay. To blanch the tops for use in the winter and spring a few plants should be taken up at a time, and be placed in a

Encreno Oak (*see Quercus aquifolia*).
Enchanter's Nightshade (*see Circeæa*).
Encholirion (*see Dyckia and Tillandsia*).
Endera (*see Taccarum*).
Enemion (*see Isopyrum*).

cellar or other place from which light can be excluded. A Mushroom house is excellent.

A Selection of Varieties :—

Round-leaved Batavian. Moss curled.
Green curled. White curled.

ENGELMANNIA (*syn.* ANGELANDRA).

The plant (*ord.* Compositæ), now known as *Engelmannia*, is a good hardy perennial. Seeds may be sown in the open border in March or April. The plants will grow in common garden soil. *Engelmannia* of Pfeiffer is now *Cuscuta*, and is a distinct genus from that here named.

Only Species :—

pinnatifida, 2', Jy., yel.



EPACRIS MINIATA SPLENDENS (*see* p. 320).

ENKIANTHUS.

A small genus (*ord.* Ericaceæ) of greenhouse or hardy evergreen or deciduous shrubs. Propagated by cuttings of half-ripe wood in spring in very sandy soil beneath a bell-glass, with a little air constantly. A compost of fibrous loam two parts and peat one part, with sand, suits.

Principal Species :—

campanulatus, 6', Jy., himalaicus, 20', Je., red,
red; this and japonicus or.
are hardy in sheltered japonicus, 5', Feb., hdy.,
spots in the south of wh.
England and Ireland. quinqueflorus, 3', My.,
pk. (*syn.* reticulatus).

ENTADA.

Attractive stove evergreen climbers (*ord.* Leguminosæ), that grow freely in equal parts, of loam

and peat. Increase is by cuttings of half-ripened shoots in sand beneath a bell-glass over bottom heat. All the species produce white flowers and range from 20' to 30' in height.

Principal Species :—
africana. polystachya. scandens.

ENTELEA.

A genus of evergreen greenhouse plants (*ord.* Tiliaceæ). Propagation is by cuttings of half-ripened growths in very sandy soil beneath a bell-glass. Soil, three parts of good loam, one part of peat, and half a part of coarse sand.

Principal Species :—
arborescens, 20', My., wh. palmata, 4', My., wh.

OMECON.

A very pretty hardy perennial (*ord.* Papaveraceæ), with white flowers on stems sometimes 2' high, though generally rather less. It likes a moist, peaty soil, and in a low, damp spot increases quickly at the root. Increased by division in spring.

Only Species :—
chionantha, 2', My., wh.

EPACRIS.

Exceedingly beautiful greenhouse evergreens (*ord.* Epacridæ) from Australia. Propagated by cuttings of the tips of the shoots in April or August, inserted in sandy peat beneath a bell-glass. Sandy, fibrous peat is the best soil. When the cuttings are rooted, place them singly in small pots, and keep them close, admitting air as progress is made. Repot as necessary, making the soil firm about the old ball. Top the shoots. After flowering, the plants must be cut back, the point of severance differing according as the variety is of erect or pendulous habit. The drainage must be perfect at all times, and the plants must be watered with care. If mildew should prove troublesome, dust with flowers of sulphur, and keep the plants out of draughts.

A Selection :—

The number of species is comparatively limited, and as garden hybrids are numerous, a selection of both will be more useful than a list of the former alone. They flower from January onwards. The average height is between 2' and 3'.

Principal Species :—

acuminata, a bushy shr. longiflora, crim., red, wh.
hyacinthiflora, wh., car. (*syns.* grandiflora and
red vars. miniata).
impressa, Mch., flowers miniata (*see* longiflora).
wh. to red. Campanu- — splendens (*see* p. 319).
lata, cerasiflora, nivalis, purpurascens, Jan., Mch.,
and variabilis are vars. wh., flushed pk. (*syn.*
onomasteflora).

A Selection of Varieties and Hybrids :—

alba odorata, wh., frag- Lady Panmure, spr., wh.,
rant. ro.
autumnalis, Oct., red, wh., Mont Blanc, Ap., wh.,
hybrid. lemon.
devoniana, sc. pulchella major, My., wh.
Eclipse, spr., crim., wh. Sunset, Mch., red, pk.
Ingramii, red, pk. The Bride, wh.
Vesuvius, crim., sc.

EPHEDRA.

A genus (*ord.* Gnetaceæ) of hardy evergreens, whose berries are eaten by the Russian peasantry. The plants will grow in any soil, and may be

increased by layering the extremities of the branches. The flowers of all are inconspicuous.

Principal Species :—

altissima (twiner), 20', grh. distachya, 2', Je.

EPICATTELEYA.

By hybridising Epidendrums with Cattleyas several distinct and pretty Orchids (*ord.* Orchidaceæ) have been raised, and these show most markedly the influence of the Epidendrum parent. They are successfully cultivated with Epidendrums and Cattleyas.

Hybrids :—

guatemalensis wischusen- Jan., rich pur. (C. bow-
iana, 1½', Mch., Ap., ro., ringiana × E. o'brien-
crim. A natural hybrid, anum).
probably between Cat- radiato-bowringiana, 1½',
tleya Skinneri and Epi- Je., ro., wh., crim. (E.
dendrum aurantiacum, radiatum × C. bow-
Mrs. James O'Brien, 1½', ringiana).

EPIDENDRUM.

Description.—Many of these tropical American Orchids (*ord.* Orchidaceæ) are of rather tall and slender growth, but there are some others with short and stout pseudo-bulbs. The flowers are not remarkable for their size, but those of horticultural value are elegant, and have brilliant colours. About 500 species have been described, but not more than a tenth of these are worth cultivating. Several good hybrids have been raised, and these grow readily and flower freely.

Cultural Points.—The majority grow best in a cool stove or Mexican house, but a few, including vitellinum, require cooler treatment; and one at least, bicornutum, loves the hot, moist conditions of the East Indian House, and likes to be suspended over a water tank. Pots or pans are generally more suitable than baskets, as they afford better opportunities for inserting sticks to keep the growths erect. At least half the pot should be filled with crocks, and on this, in a mixture of fibrous peat and sphagnum moss, place the plant, raising the centre slightly above the rim. At no season of the year do Epidendrums need "drying off," but naturally less moisture is required by the roots when growth is at a standstill than when leaves and stem are increasing, or flowers being produced.

Principal Species and Hybrids :—

atropurpureum, 3', Ap., elegantulum, 3', Mch. to
My., br., pur., wh. My., pur., pk; luteum
(*syn.* macrochilum); is a yel. form, and
album and Randii are leucochilum has a wh.
good forms. lip (Endresio - Wallisii
bicornutum, 1½', Mch. × Wallisii).
to My., wh. (correctly, Endresii, 1', Mch., Ap.,
Diacrium bicornutum). wh., grn., or., pur.
ciliare, 1½', Jy., wh. Endresio - Wallisii, 2½',
fragrant at night. Jan., Ap., yel., wh., pur.
cinnabarinum, 4', My. to (Endresii × Wallisii).
Jy., sc., or., yel. evectum, 5', sum., rich
cochleatum, 1', sum., pur. magenta, pur.
greenish yel. Frederici - Guilielmi, 3',
cooperianum, 3', sum., Je., ro., wh.
grn., br., ro. Medusæ, 6'', Je., red,
Clarissa, 2', Ap., grn., pur. (*syn.* Nanodes
red, pur. (elegantulum Medusæ).
× Wallisii). nemorale, 3', Jy., ro., wh.
dellense, Ap., or., yel. (*syn.* verrucosum).
(xanthinum × radicans). o'brienianum, 3', sum.,
dichromum, 3', aut., wh., car., yel. (evectum ×
ro., yel. radicans).

Ephemerum (*see* Tradescantia).

Ephippium (*see* Cirrhopetalum).

Engelmannia (*of* Pfeiffer, *see* Cuscuta).

English Iris (*see* *Iris siphnioides*).

Eopepon (*see* *Trichosanthes*).

osmanthum, 2½', My.,
grn., br., wh. (*syn.*
godseffianum).
paniculatum, 3', Ap., My.,
rosy lil.
parkinsonianum, 2', Jy.,
Sep., grn., yel.
prismatocarpum, 3', Je.,
Jy., yel., *pur.*
radicans, 8', aut., or. sc.
(*syn.* rhizophorum).
stanfordianum, 1½', Ap.,
My., yel., wh., red.

Other Species :—

alatum, 1½', Je., Jy., grn.,
wh., pk.
Brassavolæ, 2', sum., yel.,
pur.
Catillus, 4', Mch., sc., yel.
cnemidophorum, 5', My.,
yel., crim., wh., ro.
clipticum, 3', Mch., Je.,
ro.
elongatum, 3', spr., bright
ro.
fragrans, 9', sum., wh.
Hamburii, 2', spr., *pur.*,
ro.
inversum, 9', aut., wh.,
fragrant.

vitellinum, 1', Je., Sep.,
bright or.
— majus, 1', Je., Sep.,
rich or.
Wallisii, 3', Oct. to Mch.,
yel., crim., wh., frag-
rant.
Wallisio-ciliare, 4', Nov.,
Jan., yel., cream
(Wallisii × ciliare).
xanthinum, 2½', win.,
yel., or.

lindleyanum, 2', win., ro.,
pur., wh. (*syn.* Barkeria
lindleyana).
polybulbon, 3', win., grn.,
pur., wh.
Pseudepidendrum, 3',
Jan., Feb., grn., yel.,
sc.
sceptrum, 3', Sep., yel.,
pur.
Schomburgkii, 4', spr., sc.
Skinneri, 1', Jy., grn.,
wh. (*syn.* Barkeria
Skinneri).
variegatum, 1', Jan., Feb.,
grn., wh.

Other Species :—

alsinifolium, 1½', Je., ro.
Fleischeri (*see* Dodonæi).
lanceolatum, 1½', Jy., *pur.*
nummularifolium, 6', pk.

— longipes.
parviflorum, 1', Je., ro.
roseum, Je., Jy., ro.

EPIMEDIUM. (BARRENWORT.)

Elegant, dwarf, hardy perennials (*ord.* Berber-
ideæ), well adapted for rockwork or for borders.
They have pretty and uncommon-looking flowers,
and their foliage is often beautifully tinted.
Propagated by division of the roots in summer, or
by seeds sown in pots in spring in a frame. Sandy
loam, or loam and peat in equal proportions, form
the best compost, although they grow freely in any



EPILOBIUM DODONÆI.

**EPIGÆA. (GROUND LAUREL. MAY-
FLOWER.)**

A charming little sweet-scented, trailing plant
(*ord.* Ericaceæ), which likes a moist, shady posi-
tion in peaty soil. It is of evergreen habit, and
has pretty racemes of white flowers, tinged with
pink, which exhale a spice-like odour. It is prop-
agated by division of good-sized plants only.

Only Species in Cultivation :—

repens, 6", Jy., wh.

EPILOBLIA.

By fertilising Epidendrums with the pollen of
Lælias, hybridists have evolved several interesting
bigeners (*ord.* Orchidaceæ). These grow freely in
the Cattleya house under similar treatment to that
accorded to dwarf Epidendrums.

Hybrids :—

Charlesworthii, 1½', Jy., wh., vio. *pur.* (E. cili-
are × L. anceps).
L. cinnabarina).
hardyana, 1', Nov., *pur.*,
radico-purpurata, 1½', Jy.,
rosy red, *pur.*, yel. (E.
radicans × L. pur-
purata).

EPILOBIUM.

The Willow Herbs, as Epilobiums (*ord.* Ona-
grariæ) are popularly called, are—with about one
exception, villosum—hardy herbaceous perennials
that can be readily cultivated in any good garden
soil. Several species are natives of Britain, and
such strong growers as angustifolium, its white
form album, and hirsutum, are most attractive
when grown in masses by the side of water. Prop-
agated by seeds sown in spring or autumn, or by
division of the clumps in autumn.

Principal Species and Varieties :—

angustifolium, 4', Jy., hirsutum, 4', Jy., *pur.* —
Aug., *pur.* — variegatum, 4', Jy.,
— album, 4', Jy., wh. *pur.*, ro.
— grandiflorum, 4', Jy., oboordatum, 9', sum.,
Aug., bright *pur.* ro.
Dodonæi, 1½', Jy., *pur.* rosmarinifolium, 2', Je.,
(*syn.* Fleischeri) (*see* *pur.*
figure).

good garden soil. The Epimediums will thrive
well in shady places, and even under trees where
many other plants will not grow. The best time
to transplant is in early spring, or in July.

Principal Species and Varieties :—

alpinum, 9", My., crim., — violaceum (*syn.* E.
yel. violaceum), smaller,
macranthum, 1', My., vio.
wh., bl.: the finest.
— versicolor, bl., wh. pinnatum, 9" to 18", My.,
yel.

Other Species :—

concinnum, 9", Mch., muschianum, 9", Mch.,
Ap., *pur.* wh.
diphyllum, 9", Ap., My., perralderianum, 9", Je.,
wh. (correctly Aceran- yel.
thus diphyllum). pteroceras, 9", yel.
hexandrum (correctly rubrum, 9", My., red, yel.
Vancouveria hexandra). sagittatum, 1', yel., wh.

EPIPACTIS.

Interesting and pretty British plants (*ord.*
Orchidaceæ), not often cultivated. They succeed
best in a well-drained, but moist, position, such as

the lower part of a rockery. Wild specimens should be marked at flowering time, and they may be lifted and successfully replanted in the garden when dormant. *Ensifolia* and *rubra* are now referred to the genus *Cephalanthera*.

Principal Species :—
latifolia, 1½', Jy., pur. *palustris*, 1½', Jy., grn.,
 (*syn. purpurata*). pur.

EPIPHRONITIS.

This bigeneric hybrid (*ord. Orchidaceæ*) has been derived by the intercrossing of *Epidendrum radicans* and *Sophranitis grandiflora*, the one a very tall, and the other a very dwarf, Orchid. Similar treatment to that accorded to *Sophranitis* suffices for the hybrid, with, perhaps, a few degrees more warmth during winter.

Only Member :—

Veitchii, 1', Je., Jy., or. sc., yel.

EPIPHYLLUM.

A genus (*ord. Cactææ*) of very beautiful stove or greenhouse plants, with fleshy leaves. Propagated by grafting upon either *Cereus speciosissimus* or *Pereskia aculeata*, the stocks having a clear stem of 1'. The scions are attached to the stock by spines, and require no tying or covering, but after being worked the plants should be placed in gentle heat. Also by cuttings. Soil, two parts fibrous loam and one part each of leaf mould and mortar rubbish. Perfect drainage is essential. Start the plants into growth in February, at the warmest part of the greenhouse, and at midsummer place them in a rather cooler position. Winter the plants on a dry stage, only giving sufficient water to prevent shrivelling.

Principal Species :—

Gartneri, Ap., or. sc.
 (*syn. makoyanum*).
russellianum, My., ro.
truncatum, Je., red ro.

There are several very beautiful vars., notably *coccineum*, *ruckerianum*, *salmoneum*, and *violaceum superbum*.

Other Species :—

Guedneyri, My., red, crim., wh.

EPISCIA.

This genus contains some of the prettiest of dwarf, perennial, stove foliage plants (*ord. Gesneriaceæ*). Many are of creeping habit, and as they succeed in rather deep shade they may be utilised for furnishing borders between paths and hot water pipes. Cuttings inserted in sandy soil and kept for a while in a close case, or under a bell-glass in the stove, root at any season of the year. Heat, moisture, and a fair amount of shade are necessary to free growth.

Principal Species :—

chontalensis, 6", Jy., wh.
 (*syn. Cyrtodeira chontalensis*).
cupreata, 1½', Je., sc., yel.

(*syn. Cyrtodeira cupreata*).

fulgida, 6", Jy., sc.
maculata, 6", Je., yel., br.
picta, 9", Jy., wh.

Other Species :—

bicolor, 3", Jy., pur., wh.
bractescens, 2', Je., wh.
glabra, 1', Oct., wh.
melittifolia, 1', Mch.,

crim. (*syn. Besleria melittifolia*).
pulchella, 2', Jy., yel., red.
tessellata, Jy., yel. (*syn. Centrosolenia bullata*).

EPISTEPHIUM.

A South American genus, closely allied to *Sobralia* (*ord. Orchidaceæ*), and containing about half a dozen species, though only one appears to be

Epiphanes (of Blume, see *Gastrodia*).

Epiphora (see *Polystachya*).

Epiphyllum (of Haworth, see *Phyllocactus*).

in cultivation. This is a terrestrial Orchid that thrives in the stove if planted in fibrous loam and sand over ample drainage.

Only Cultivated Species :—

Williamsii, 1½', sum., rosy mauve, wh., yel.

EQUISETUM. (HORSETAIL.)

A genus of plants (*ord. Equisetaceæ*) which are adapted for covering wet places at the edges of ponds and lakes, but which spread so rapidly as to be troublesome in many places. They are propagated by division, and grow in any wet soil. The plants become troublesome weeds in some places. Persistent cultivation and drainage get rid of them.

Principal Species :—

arvense, a weed. *maximum*, 2' to 6' (*syn. Telmateia*).

ERAGROSTIS. (LOVE GRASS.)

Perennial or annual Grasses (*ord. Gramineæ*), some of which are of considerable beauty, and of value in the garden or for cutting. They may be sown in the open in April or May, and the perennials can also be propagated by division.

Principal Species :—

egyptiaca. *major* (*syn. megastachya*).
capillaris. *peruviana* (*syn. Poa peruviana*).
elegans.

ERANTHEMUM.

A large genus (*ord. Acanthaceæ*). Several of the species are of value for the decoration of warm greenhouses. As the majority flower during the winter, it is essential that cuttings from old, cut-back plants should be inserted in sandy soil under a bell-glass early in the season to ensure good specimens. Avoid over-potting. For compost, use two parts of loam to one part each of peat and leaf soil, adding sufficient sand to keep the whole porous. Pinch out the points two or three times during the season, to promote a bushy habit.

Principal Species :—

albiflorum, 2½', Jy., wh. *cinnabarinum*, 3½', win.,
Andersonii, 1½', Nov., sc.
 wh., pur. *Cooperi*, elegant foliage
asperum, 1½', Mch., wh., plant.
 pur. *laxiflorum*, 2', win., red,
 pur. *tuberculatum*, 2', spr., wh.

Other Species :—

atropurpureum, dark pur. *pulchellum* (now *Dædal-*
 lvs. (*syn. nigrescens*). *acanthus nervosus*).
bicolor, 6", Jy., wh., red. *reticulatum*, grn. and yel.
elegans, 3', Je., sc. lvs. (*syn. Schomburg-*
macrophyllum (now *Dæ-* *kii*).
dalacanthus macro- *strictum* (now *Dædal-*
phyllum). *acanthus strictus*).
maculatum, wh., pur. *variabile*, 2', Je., pur.
nervosum (now *Dædal-*
acanthus nervosus).

ERANTHIS. (WINTER ACONITE.)

Eranthis hyemalis (*ord. Ranunculaceæ*) has already been spoken of under the title of Winter Aconite, so that little need be said about it now. It has solitary yellow flowers, and is among the earliest to bloom outside. It likes a rather moist soil, and is a capital plant to naturalise in shady positions. It is propagated by seeds, or by division of the tubers.

Principal Species :—

cilicica, 6", Mch., Ap., or. *hyemalis* (Common Win-
 yel. Later than hye- *ter Aconite*), 4" to 8",
 malis, not so hardy. Jan., yel.

ERCILLA (*syn.* BRIDGESIA).

A little-grown, but desirable, creeping plant (*ord.* Phytolaccaceæ), which is well suited for clinging to walls like Ivy. It has racemes of purplish flowers, and rather hard, entire leaves. Propagated by cuttings or layers. Common soil.

Principal Species :—

vulabilis, pur. (*syn.* Bridgesia spicata).

EREMÆA.

These low-growing evergreen shrubs (*ord.* Myrtaceæ) thrive best under greenhouse treatment. They are propagated by means of cuttings, inserted in sandy soil in spring, and kept close under a bell-glass until well rooted. For compost use one-third peat and two-thirds loam, with sand.

Principal Species :—

fimbriata, Je., pk.

pilosa, Je., pk.

EREMIA.

South African greenhouse shrubs (*ord.* Ericaceæ) closely allied to the Heaths. Propagated by cuttings of the young growths. Soil, sandy peat.

Principal Species :—

Totta, 2', Je., red.

EREMOSTACHYS.

Pretty hardy perennial plants (*ord.* Labiatæ) which have their flowers in long, whorled spikes. They grow readily in any common soil, and are propagated by division in spring or early autumn, or by seeds sown in a frame or nursery border in April or May.

Only Cultivated Species :—

laciniata, 1½', Jy., yel. — flava, yel. (*syn.* iberica).

EREMURUS (*syn.* AMMOLIRION).

Noble hardy plants (*ord.* Liliaceæ) with fine leaves and massive spikes of beautiful flowers, which produce a splendid effect in the border. Propagated by seed, sown when ripe, or in spring, in pots. Grow under glass for a year or two until strong. They are several years in attaining to flowering size. A good but not too heavy soil suits the Eremuruses. As growth is made early in spring, they ought to be planted where they can have protection from cold winds then. They do not object to a little shade during part of the day, and some contend that they should be planted in thin woods. When growth begins, protection from slugs is needed, and in severe frost a little covering is desirable. Autumn is the best time to plant. The crowns may be covered with 3" of soil.

Principal Species :—

Aitchisonii, 5', Je., red. robustus, 6' to 9', Je., peach. Very handsome.
himalaicus, 2' to 6', Je., wh. One of the prettiest and most easily grown. — Elwesii, earlier, more beautiful and robust, pk.

Other Species :—

altaicus, 3', Je., yel. Korolkowi, 4', Je., ro.
bucharicus, 3', Je., wh. Olge, 4', Je., Jy., blush.
Bungei, 3', Je., yel. spectabilis, 3', Je., yel.
(*syn.* aurantiacus) (*see* figure). (*syn.* caucasicus).
turkestanicus, 3', Je., yel.

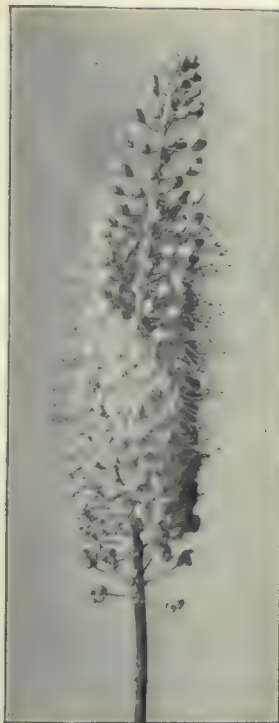
ERGOT.

Probably more than one species of the genus Claviceps (Fungi) attack the inflorescences of Grasses and Carex, and produce that deformed and enlarged condition of the grain known as Ergot. Ergot of Rye is produced by Claviceps purpurea, and it is said that though a valuable drug is obtained from it, the continued consumption of

bread made from diseased Rye has led, in such districts as Lorraine and Burgundy, to a very large number of deaths from a form of poisoning and gangrene known as Ergotism.

ERIA.

A large genus of low-growing Orchids (*ord.* Orchidaceæ) containing comparatively few plants of horticultural value. Deep pans or baskets are the best receptacles for Erias, and they should be planted in fibrous peat and sphagnum moss over ample drainage. A stove temperature suits them



EREMURUS BUNGEI.

best, and abundance of water is necessary during summer. Though "drying off" must not be practised, much less moisture is needed during winter.

Principal Species :—

acervata, 6'', Ap., My., wh. ferox, 1', Aug., br., wh.
barbata, 1', Feb., Mch., (*syn.* Trichotosia ferox).
yel., br., pur. flava, 1', sum., yel., pur.
bractescens, 8'', My., wh., floribunda, 1', Ap., My.,
crim. wh., crim.
extinctoria, 1'', Ap., My., obesa, 8'', Feb., wh., pk.
wh., pur. The smallest stellata, 2', sum., yel., red.
Orchid in cultivation.

Other Species :—

Corneri, 8'', sum., grn., Meirax, 6'', aut., pur., br.
wh., pur. ornata, 1', sum., dull yel.,
excavata, 6'', Je., wh., grn.
yel., pk. rosea, Oct., rosy pk.
marginata, 6'', sum., wh., vittata, sum., grn., red.
yel., red.

ERIANTHUS.

Handsome perennial Grasses (*ord.* Gramineæ) suitable for warm, sunny positions in the garden

or pleasure grounds. *Ravennæ* has been much used for sub-tropical effects in the garden in summer. They like a rich but dry soil, and are propagated by division or seeds.

Principal Species :—

Monsteiri, 9'. *Ravennæ*, 6'. *saccharoides*, 8'.

ERICA.

Description.—This is the typical genus of its order (*Ericaceæ*), and comprises a very large number of shrubby plants, mostly hard-wooded,



ERICA CAVENDISHIANA (see p. 325).

that are, with the exception of a few hardy species, natives of South Africa. All are comparatively slow growers, but they produce large numbers of rather small blooms, and make a fine floral display in their season. A reference to the selections given will show that this genus of Cape Heaths can be so arranged that representatives are in flower the whole year through. Thirty years ago the cultivation of hard-wooded plants was at its height. A reaction followed, and for years Heaths were generally conspicuous by their absence. At the commencement of the twentieth century we find Heaths becoming increasingly popular, but the demand is for small, freely flowered plants in 5" and 6" pots.

Propagation.—By cuttings, taken about the beginning of July. Sturdy young shoots are the best, and all leaves must be removed from the portion to be inserted. Drain a 5" pot well, put in some rough peat, then add finely sifted peat and sand, and make the whole firm. Insert the cuttings, and make each quite firm. As each potful is finished give a surfacing of fine silver sand, remove

to a close frame or pit, and place under a bell-glass in a shaded spot in a warm greenhouse. Slight sprays or waterings will be needed from time to time, but must be given with the utmost care. In the following spring the tiny plants should be potted singly into small, well-drained pots of light, peaty soil, and again kept close until thoroughly established. Hardly any water at the roots will be necessary until new growth commences. Give the young Heaths an elevated position, so as to avoid attenuated growth.

Soil.—Peat and sand are necessary for the cultivation of Heaths in pots. The former need not be of a fibrous character like that used for Orchids, or flaky like that used for *Rhododendron* beds, but rather of a finer, more earthy texture, capable of being firmly compacted. Anything like sourness in the soil is death to Heaths, just as drought would be; their fine and tender rootlets are as quickly killed by the one as the other. The necessity for crocking the pots with the utmost care will be patent.

Other Cultural Points.—February or March is a good time for potting Heaths, but the condition of the plant must always be the first consideration. Be quite sure that the ball of soil and roots is moist throughout before potting. Ram the compost firmly and evenly, and finish off with a surfacing of sharp sand. Keep the structure somewhat close for a few weeks after potting to encourage quick rooting. Success in Heath culture depends more upon how the plants are watered than anything else, and it is in this that the most mistakes are made. When water is given, sufficient must be supplied to thoroughly moisten the whole body of soil and roots; if potting has been properly done, the mass will be moist when water passes freely out of the drainage hole. Established Heaths require abundance of air during summer and autumn, and only during the severest weather need the ventilators be quite closed. Draughts must, however, be avoided. Nearly all the Heaths, except, perhaps, *cavendishiana*, may be put out of doors during August and most of September, provided they are sheltered from strong winds and are plunged in a bed of ashes kept moist. The Cape Heaths are essentially cool greenhouse plants; 38° to 40° should be regarded as the winter minimum, while in summer the more fresh air they have the better. A closer atmosphere, which necessitates a rise of temperature, is advisable for a short time after potting.

Hardy Heaths.—These form a group of beautiful and mostly low-growing shrubs, that chiefly flower during autumn, winter, and spring. Well-rooted plants offer no cultural difficulties if a peaty soil is provided, or, failing peat, a mixture mainly composed of leaf mould. All those having a low, tufted habit are easily propagated by division in late autumn or early spring, but the taller forms must be increased by cuttings of young growth taken in autumn, and inserted as firmly as possible in pots of finely sifted and very sandy peat. When inserted and watered, place them in a cold frame, and keep them close until rooted.

It is of interest to note here that Brier-root tobacco pipes are made from the tough, irregular wood of *Erica arborea*, a species that grows to a considerable size on the Mediterranean shores. *Bruyère*, the French for Heath, has become corrupted to Brier.

Principal Species, Varieties, and Hybrids:—

- semula, 9", My., Aug., grn., red.
aitoniana, 2', Aug., wh., pur.
aristata, 1½', Je., pur., wh.
banksiana, 6", Je., pur., wh.; there are wh. and pur. vars.
cafra, 1½', My., wh.
cavendishiana, 4', My., Jy., yel.; hybrid (see p. 324).
cerinthoides, 1½', Sep., sc.
Chamissonis, 1½', Jy., ro.
coccinea, 16", Je., sc.
depressa, 9", Jy., yel.
devoniana, 1½', My., Je., red, pur.
gracilis, 1', Meh., pur., red.
hymalis, 1½', win., spr., ro.
irbyana, 1½', Aug., wh., grn.
jasminiflora, 2', Aug., wh., pk.; hybrid.
macnabiana, 1½', My., Jy., pk., wh.
marnockiana, 1½', Jy., Sep., pur., crim., wh.; hybrid.
- Massoni, 3', Aug., red, grn. (*syn. acuminata*).
persoluta, 1½', Ap., pur.
perspicua, 2', My., pur.
— nana, pk., dwarf.
shannoniana, 1½', Je., wh., pur.
spenceriana, 1½', My., Jy., pur. lil. (see figure).
tricolor, 2', Je., red, grn.
tubiflora, 2', My., pk.
ventricosa, 1', Je., flesh pk. Several beautiful colour variations bear the names of alba, carnea, and coccinea; *superba* is sc.
versicolor, 2', Aug., or., red.
verticillata, 2', Aug., sc.
vestita, 3', My., Jy., wh.; alba, wh.; carnea, flesh; coccinea, sc.; fulgida, or.; incarnata, pk.; lutea, yel.; purpurea, pur.; and rosea, ro., are varietal forms.
willmoreana, 1½', Je., red; hybrid.

Principal Hardy Species:—

- arbores, 5' to 10', My., wh.; distinct vars. are minima, squarrosa, and stylosa.
australis, 3' to 4', Meh. to My., red.
carnea, 6", Feb., pur. (*syn. herbacea*).
— alba, wh.
ciliaris, Jy., Sep., pur.
cinerea, 1½', Jy., crim., pur.; colour variations from the type have been named alba, atropurpurea, atrosanguinea, purpurea, and rosea.
- lusitanica, 4', Feb., pk. (*syn. codonodes*).
mediterranea, 1' to 4', Ap., pur.; alba, glauca, and hybrida are good forms.
stricta, 2', Sep., pur.
Tetralix, 1', Jy. to Sep., pale red; alba and rubra are good vars.
vagans, 1', Aug., Sep., red, pur.; alba, grandiflora, and rubra are cultivated vars. of this Cornish Heather.

Other Species and Hybrids:—

- affinis, 1½', Ap., My., yel.
alopecuroides, 2', Sep., Oct., red, pur.
ampullacea, 2', Je., wh., red.
aurea, 2', Aug., or., yel.
bandoniana, 2', Jy., pur.
beaumontiana, 6", Je., pur.
bergiana, 1½', My., Je., pur.
blanda, 2', My., pur., or.
bruniades, 6", My., Jy., pk.
colorans, 2', My., wh., red.
concinna, 2½', Sep., pk.
elegans, 6", Aug., grn.
- grandinosa, 6", Meh., wh.
mammosa, 2', Aug., pur.
maweana, pk., wh., hybrid.
melanthera, 3', spr., pk.
Paxtonii, 1½', Je., Aug., red, grn., br.
Petiveri, 2', My., yel.
plumosa, 1', Meh., Jy., pur.
retorta, 1', Je., pk., wh.
Solandra, 2', Je., pk.
speciosa, 2', Jy., red, grn.
Uhria, 2', Aug., red, grn. (*syn. eweriana*).
urceolaris, 1', sum., wh.
Vernix, 1', Jan., My., golden yel.

ERICINELLA.

A small-growing, Heath-like shrub (*ord. Ericaceae*), needing precisely similar treatment to that accorded to dwarf Heaths.

Principal Species:—

Mannii, Jy., crim.

ERIGERON. (FLEABANE.)

A large genus (*ord. Compositae*), comprising many good garden plants, as well as a number of

Ericala (see *Gentiana*).

Ericoila (see *Gentiana*).

hardly any value. It is impossible to name more than a few of those worth growing. They have Daisy-like flowers, and are suitable for the border or rock garden. All those named are perennials. Propagation, by seeds sown in spring in the open, or in a frame, or by division in spring. Any common garden soil will suit the greater number, but a few of the dwarf species like one of a light character. Snails and slugs are frequently very destructive to *Erigerons* in late autumn, and must be searched for and destroyed.

Principal Species and Varieties:—

- alpinus, 1', Jy., pur.
— grandiflorus.
— semi-barbatus (*syn. Roylei*), very fine.
aurantiacus, 6", Jy., or.
— superbus.
glaucus, 1', Aug., pur.
grandiflorus, 1½', Aug., pur. (*syn. macranthus of Nuttall*).
macranthus [of Hooker], 1½', Jy., per., ro. (see p. 326).
philadelphicus, 1½', Jy., pk.
speciosus, 3', Aug., bl. (*syn. Stenactis speciosa*), var. *superbus*.

Other Species:—

- bellidifolius, 1', Ap., pur.
Coulteri, 1½', Je., wh.
glabellus, Je., pur.
— mollis.
maximus, 1½', Jy., hlf-hdy. per., pur.
mucronatus, 6" to 12", pur.
- multiradiatus, 1', Jy., pur.
pulchellus, 1', Jy., pur. (*syn. caucasicus*).
salsuginosus, 1', Je., pur., wh.
Villarsii, 1', Jy., pur.



ERICA SPENCERIANA.

ERINACEA.

One species only makes up this genus (*ord. Leguminosae*), which is closely allied to *Anthyllis* and needs the same cultural treatment. The species, *pungens*, likes a dry, sunny nook in a rockery.

Only Species:—

pungens, 6" to 12", Ap., hdy., bl., pur. (*syns. Anthyllis Erinacea* and *Erinacea hispanica*).

ERINUS.

A lovely little Alpine plant (*ord.* Scrophularinæ), which is valuable for crevices in rock and wall gardens. It likes a light, dry soil, and is best propagated by seeds sown in spring or autumn where the plants are to bloom. In wet districts it suffers from winter rains unless in a vertical position in the rockery. The South African species are not generally grown.

Principal Species :—

alpinus, 4", My., pur. There are wh. and ro. vars.



ERIGERON MACRANTHUS (see p. 325).

ERIOCEPHALUS.

These South African plants (*ord.* Compositæ) are shrubby and evergreen, needing greenhouse protection. Propagation, by cuttings in spring, and a compost of sandy loam and peat.

Principal Species :—

africanus, 4', win., wh. racemosus, 3', Mch., yel.
glaber, 4', Ap., yel.

ERIOCHILUS.

A small group of terrestrial Orchids (*ord.* Orchidaceæ) from Australia. They will grow in a cool house if placed in sandy peat and fibrous loam over good drainage.

Principal Species :—

autumnalis, 1', Oct., red.

Erinosma (see *Leucogonum*).

Eriocalia (see *Actinotus*).

Eriocampa (see *Nemflies*).

Eriocarpha (see *Montanoa*).

ERIOCHEMA.

Beautiful little stove foliage plants (*ord.* Melastomaceæ), that need to be treated like *Anæctochilus* and *Bertolonias*, in peat, sand, and moss, in a close case or under a bell-glass.

Principal Species and Varieties :—

ænea (correctly *Bertolonia* marmorata (correctly *Bertolonia marmorata*).
Fascination, 6", Aug., pk. Sanderæ, 6", aut., grn., wh. lvs.

ERIODENDRON (*syn.* CEIBA).

Very tall-growing trees (*ord.* Malvaceæ), closely allied to the genus *Bombax*. Under cultivation they are evergreen stove trees, raised from seed and grown in substantial loam with sand.

Principal Species :—

anfractuosum, 100', sc.

ERIOGONUM.

Pretty perennial or annual plants (*ord.* Polygonaceæ), generally hardy on rockwork, where they prefer to be planted between large stones in a sunny position, in peaty soil. Propagated by seeds or division in spring.

Principal Species :—

compositum, 1', Je., per., flavum, 1', Je., per., yel.
wh. (syn. sericeum).
corymbosum, 1', Je., ro., umbellatum, 1', Je., yel.
wh., yel. (syn. stellatum).
— Sileri.

ERIOPHORUM. (COTTON GRASS.)

Very pretty plants (*ord.* Cyperaceæ), which may advantageously be grown in moist, peaty soil at the edges of ponds or in the larger bog gardens. *Polystachion* is the Cotton Grass of British bogs.

Principal Species :—

alpinum, 1'. polystachion, 1'. vaginatum, 1'.

ERIOPSIS.

A small genus of stove plants (*ord.* Orchidaceæ) that are not widely cultivated, though fairly attractive when flowering. Soil, fibrous peat and sphagnum.

Principal Species :—

Helenæ, or. rutidobulbon, 2½', Ap., Aug., pur., br.

ERIOSEMA.

Stove evergreen shrubs (*ord.* Leguminosæ). Propagated either by seeds or cuttings, in early spring. Soil, equal parts of peat and loam with sand.

Principal Species :—

grandiflorum, 2', Aug., violaceum, 4', Mch., pur. yel.

ERIOSPERMUM.

Rather pleasing greenhouse bulbs (*ord.* Liliaceæ), of which only a few are in cultivation in botanic gardens. They are propagated by offsets, and prefer a peaty soil, and to have a period of rest in winter.

Principal Species :—

albucoides, 9", Jy., yel. proliferum, 9", Jy., wh.,
Bellendenii, 1', Jy., bl. grn.
brevipes, 1½', Jy., wh.

Eriochosma (see *Nothochlæna*).

Eriocoma (see *Montanoa*).

Eriopappus (see *Layia*).

ERIOSTEMON.

Spring and early summer flowering shrubs (*ord.* Rutaceæ), natives of Australia. They flower abundantly, and are fine for conservatory decoration when grown in pots, but better still if planted in a bed or border. Cuttings root quickly if inserted early in the spring in sandy peat and given bottom heat. Soil, three parts peat, one part loam, and sand. Give ample drainage, and pot firmly.

Principal Species :—

buxifolius, 4', My., pk. (*syns.* cuspidatus and
myoporoides, 3', Sep., wh. nerifolius).

Other Species :—

Crowei (*see* Crowea saligna). myoporoides minor, 2',
ericifolius, 3', Je., red. Ap., ro.
internedius (*see* myoporoides minor). pulchellus, 3', My., blush;
salicifolius, 2½', Ap., red. hybrid.
scaber, 2', Ap., My., pk.

ERISMA.

Interesting tropical American trees (*ord.* Vo-chysiaceæ), needing stove treatment and a compost of sandy peat and loam. Firm young shoots root freely in spring under a bell-glass. One species, Japura, 120', autumn, yellow, bears large red fruits, from which the natives extract the kernels, and either eat them raw, or pound and cook them to form a vegetable butter. Another species is floribundum, 50', October, blue.

ERITHALIS (*syn* HERRERA).

West Indian shrubs or small trees (*ord.* Rubi-acæ) that succeed under stove treatment.

Principal Species :—

fruticosa, 15', Jy., wh.

ERITRICHIMUM.

Ornamental perennial or annual plants (*ord.* Boraginææ), best known from the beauty of the Alpine species nanum, which taxes the skill of Alpine growers to retain in their gardens. The annual strictum is rather a showy plant. They are propagated by seeds sown under glass in spring, or by divisions or cuttings of the perennials. Mr. W. A. Clark, of York, who grows nanum well, recommends that it should be grown in a sunny fissure where it can be kept dry from September until January. After the end of January give water without wetting the foliage. Soil, fibrous peat, leaf mould, and grit, in equal proportions, with a little sand. The other species present no difficulty.

Principal Species :—

barbigerum (*see* Krynitz- rupestre, 1', Jy., bl.
kia barbigeræ). strictum, 1½', Jy., ann. or
nanum, 2', Je., bl. bien., bl.

ERNODEA.

Low-growing plants (*ord.* Rubiaceæ), needing the shelter of a cool greenhouse. They are increased by division, and will grow in any poor soil.

Principal Species :—

littoralis, 2', win., wh. montana (now Putoria
calabrica).

ERODIUM. (HERON'S BILL.)

Showy hardy flowers (*ord.* Geraniaceæ), suitable for the border or rock garden. The annual or biennial species are little grown, although a few

are worth cultivating. They closely resemble the hardy Geraniums. Propagation, the annuals and biennials by seeds sown in a frame in spring, the perennials by seeds sown at the same time as the others, and also by division in spring. Soil, sandy loam.

Principal Species :—

chamedryoides, 2', My., ing Alpine; a little
wh., veined pk. (*syn.* tender.
Reichardii). A charm- macradenum, 6', Je., vio.
Manescavi, 1½', Je., pur.

Other Species :—

alpinum, 1', Je., red. pelargoniflorum, 1', Jy.,
chrysanthum, 6', Jy., wh., spotted pur.
yel. petraeum, 6', Jy., pur.
cinereum, 6', My., flesh. romanum, 6', Je., hlf-
Gussoni, 1', Je., pur. bdy. bien., pur.
hymenodes, 1', Jy., hlf- serotinum, 9', Aug., bl.
hdy. per., pk. (*syn.* tri- supracanum, 6', Jy.,
lobatum). flesh.
trichomanefolium, 4',
Jy., flesh.

ERYCINA.

A curious, small-growing Mexican Oroid (*ord.* Orchidaceæ), that will succeed in an intermediate or stove temperature if grown in pans or baskets, in peat and sphagnum. It bears its flowers in slender, drooping racemes.

Only Cultivated Species :—

echinata, 6', Ap., grn., yel.

ERYNGIUM. (SEA HOLLY.)

Description.—Elegant plants (*ord.* Umbelliferae), of perennial or biennial habit, and of great beauty in borders, or for rock gardens in full sun. They are steadily growing in favour, and are much admired for the Thistle-like appearance they present, and the pretty shades of blue on the stems and branches of many of the plants.

Propagation.—By seeds of the biennial and perennial species, and by division of the perennials in spring. Seeds may be sown in a frame or cool greenhouse in spring, or in the open in May or June.

Soil.—The greater number will grow in almost any soil, but they usually thrive best in one of a sandy nature.

Other Cultural Points.—These Eryngiums may be transplanted safely when young, but some of those which make long tap roots do not move with safety when large.

Principal Species :—

alpinum, 2', Jy., bl.; maritimum, 1', Jy., bl.
likes a light soil. Native Sea Holly; likes
amethystinum, 2½', Jy., sandy soil.
bl. oliverianum, 2', Jy., bl.
Bourgatii, 2', Jy., bl. — superbum, deep bl.
giganteum, 2', Jy., bien., planum, 3', Jy., bl.
bluish grn.

Other Species :—

campestre, 1½', Jy., bl. glaciale, 4' to 6', sum.,
caeruleum, 2½', Jy., bl. bl. (*syn.* asperifolium).
corniculatum, 2', Jy., bl. Lasseauxii, 6' to 8', Jy.,
(*see* p. 328). hlf-hdy., pur.
creticum, 2', Jy., bl. Serra, 5', Jy., hlf-hdy.,
dichotomum, 2½', Jy., bl. bl. (*syn.* platyphyllum).
eburneum, 2', Jy., wh. Spinalba, 2', Jy., wh.
triquetrum, 1', Jy., bl.

Erpetium (*see* Viola).

Errum (*see* Vicia).

Erælebia (*see* Commelina).

Eriostomum (*see* Stachys).

Erndlia (*see* Curcuma).

ERYSIMUM. (HEDGE MUSTARD.)

A genus comprising a great number of plants (*ord.* Cruciferae), of which only a small number are of any garden value. These are of annual, biennial, or perennial habit, and are easily raised from seeds, or are propagated by cuttings struck under glass. The seeds can be sown in a frame or greenhouse, or in the open ground in spring. Common soil.

Principal Species :—

alpinum, 6", My., yel.; a
var. of *hieracifolium*.
perofskianum, 1½', My. to
Aug., ann., or.

ERYTHRÆA. (CENTAURY.)

Pretty little annual, biennial, or perennial plants (*ord.* Gentianae) for the rockery in light soil. The perennial, *diffusa*, likes a half-shady position in peaty soil, and plenty of water during summer. All are propagated by seeds sown in spring.

Principal Species :—

Centaurium, 3" to 12",
Je., ann., ro. Common
Centaury.
linarifolia, 3" Je., bien.,
pk. (*syn.* littoralis).
Massoni, 6", Je., pk. (*diffusa*).
Muehlenbergii, 8', My., pk.
spicata, 1', Jy., hlf-hdy.
ann., pk.
venusta, 9', Aug., ann., pk.



Photo: Cassell & Company, Ltd.

ERYNGIUM CORNICULATUM (*see p. 327*).

Other Species :—

asperum, 9", Jy., bien.,
yel. (*syn.* arkansanum).
canescens, 9", Je., bien.,
yel.
hieracifolium, 1', My., yel.
marschallianum, 1', Jy.,
bien., yel.
ochroleucum, 1', My.,
bien., yel. (*syn.* Cheir-
anthus ochroleucus).
pumilum, 3", Je., per.,
yel.
rupestre, 9", My., yel.
(*syn.* pulchellum).

ERYTHEA.

A genus of stately Californian Palms (*ord.* Palmae), which might with advantage be cultivated in an intermediate house and treated like *Arecas*.

Principal Species :—

armata, 30' (*syns.* *Brahea*
glauca and *B. Roezlii*).
edulis, 30' (*syn.* *Brahea*
edulis).

ERYTHRINA. (CORAL TREE.)

Description.—Showy shrubs, trees, or herbaceous plants (*ord.* Leguminosae), with fine racemes of brilliant flowers. They are suitable for growing in the stove or conservatory, and the herbaceous-stemmed species are very effective if planted out of doors in summer.

Propagation.—Young shoots removed in spring with a heel attached, placed in sandy soil in gentle bottom heat, and covered with a glass, will strike readily.

Soil.—A rich compost of peat, loam, cow manure and a little sand.

Erysiphe (*see Mildew*).

Other Cultural Points.—Crista-galli and herbacea, which have herbaceous stems, are started in heat in spring; but the others, after they have been gradually sent to rest in autumn by lessening and finally stopping watering, are top-dressed, or repotted, when necessary, and started in a warm and moist house, with ample supplies of water. In some districts the herbaceous species are wintered outdoors with a good covering of dry litter.

Principal Species :—

Crista-galli, 8', My., sc. : indica, 20', My., sc. ; a
Coral Tree, several fine fine tree.
vars. — picta, variegated lvs.

Other Species :—

Bidwillii, hybrid, sc. (Crista-galli X herbacea). insignis, 40', My., sc.
caffra, 30', sum., sc. marmorata, My., sc., lvs.
constantiana, 20', sum., sc. blotched wh. (syn. indica
Corallodendron, 12', My., marmorata).
sc. Parcellii, red, lvs. variegated yel. (syn. indica
glauca, 10', sum., copper. Parcellii).
herbacea, 3', Jy., sc. speciosa, 9', Aug., crim.
humeana, 30', sc. (syn. Vespertilio, sc.
Humei).

ERYTHRONIUM. (Dog's TOOTH VIOLET.)

Beautiful little bulbous plants (*ord.* Liliaceæ), which look charming in the border, the rock garden, or in grass. The varieties of *Dens-canis* are very beautiful; and the other species, which are principally from North America, give some lovely effects. The leaves are very ornamental, and are prettily mottled or marbled. Propagation, by offsets, removed when the plants are at rest, or by seeds, although these take some time to give flowering plants. Common soil will do, but some of the Californian species like one of a light character. Erythroniums should be as short a time out of the soil as possible, and should thus be planted as early in the summer or autumn as they can be obtained.

Principal Species and Varieties :—

Dens-canis, 6'', Mch. or grandiflorum, 9'', Ap.,
Ap., pur., pk., wh.; yel.; lvs. not mottled.
common Dog's Tooth Hartwegii, 1', Mch., yel. :
Violet, several vars. earliest.
The vars. (sometimes Johnsonii, 9'', Ap., red,
considered species) japonicum, vio., pur., and pk.; beautiful.
and sibiricum, ro., pur., are nuttallianum, golden yel.,
pretty. br. anthers.

Other Species :—

albidum, 6'', Ap., wh., propullans, 6'', Ap., ro. pur.
tinged bl. purpurascens, 9'', Ap.,
americanum, 6'', Ap., yel. yel., pur.
Hendersoni, 6'', Ap., pur. revolutum Bolanderi, 9'',
Howellii, 9'', Ap., yel. Ap., wh. (syn. Smithii).

ERYTHROXYLUM.

This genus (*ord.* Linææ) has an economic rather than a horticultural value, and of the several species only one calls for special mention. This is Coca, 6', summer, green and yellow, which grows readily in a stove, and is propagated by cuttings.

Erythrocheta palmatida (see *Ligularia japonica*).
Erythrodanum (see *Nertera*).
Erythrodes (see *Physurus*).
Erythropogon (see *Metastasia*).
Erythrorhiza (see *Galax*).
Erythrolana (see *Cnicus*).
Erythrotis (see *Cyanotis*).

Its leaves are chewed, together with calcined lime, by South American Indians, and have such a stimulating effect that for several days at a stretch hard work can be accomplished by them with little other food. Of late, efforts have been made to popularise Coca as a drug and beverage.

ESCALLONIA.

Beautiful half-hardy or hardy shrubs (*ord.* Saxifragæ) valuable for growing on walls or in shrubberies. In the south and by the coast several of the species are used as hedges. Propagation, by layers and by cuttings of half-ripened shoots, struck under a hand-light or bell-glass in sandy soil; also by suckers. In cold districts the Escallonias should only be grown on walls, where they can receive some protection in severe weather. A few Spruce branches are better than a closer covering.

Principal Species, Hybrid, and Varieties :—

exoniensis, Jy., pk., wh. macrantha, 6', Je., red ;
floribunda, 10', Jy., wh. ; vars. sanguinea and In-
rather tender. gramii (syn. bicolor).
langleyensis, Je., pk. ; a philippiana, 6', Jy., wh. ;
hybrid (macrantha X one of the hardiest.
philippiana) (see p. 331). rubra, 6', Jy., red.
— alba, wh.

Other Species :—

grahamiana, 5', Oct., wh. Je., wh. (syn. berteriana).
illinita, 5', Aug., wh. punctata, 3', Je., red
montana, red. (syn. rubra var. punctata, and sanguinea).
montevidensis, 6', Jy., wh. revoluta, 10', Sep., wh.
pterocladon, 4', Jy., wh., (syn. affinis).
red. viscosa, 5', wh.
pulverulenta glabra, 9',

ESCHSCHOLTZIA.

Brilliant hardy annuals (*ord.* Papaveraceæ), which sometimes live for several years in dry, sandy soils near the sea. They are very effective in full sun, and make brilliant beds. They are raised from seeds sown where they are to bloom in March, or in autumn, protected slightly from frost. Any soil, though they prefer a sandy one.

Principal Species and Varieties :—

californica, 1½', Je., yel. There are several pretty vars., such as alba, rosea, Mandarin, and flore pleno. The charming form tenuifolia, with smaller flowers, is another var., sometimes considered a distinct species (syns. Douglasii, crocea, etc.).

ESPA LIERS.

Espalier trees should run parallel with, and in close proximity to, the garden walks, so that attention to pruning, training, and gathering is readily given, and a height of 4' to 5' should rarely be exceeded. The supports may be very simple, consisting of a few upright posts with wires strained between them, the ordinary iron fencing hurdles, and perpendicular posts inserted some 4' or 5' apart; or made more ornamental in the shape of fancy wood trellises, or open diamond-framed wooden fences. Most nurserymen supply trees ready trained for this method of growing, and a selection can be made from upright, single, oblique, and double cordons, and gridirons, fan-shaped, or horizontally trained trees, as the fancy of the planter dictates.

Escallot (see *Shallot*).
Eschenbachia (see *Coryza*).
Escheria (see *Gloxinia*).
Esmeralda (see *Arachnanthe*).



EUCALYPTUS GLOBULUS.



EUCALYPTUS LEHMANNI.



EUCALYPTUS RESINIFERA.

ESPELETIA.

These low-growing plants (*ord.* Compositæ) grow at exceedingly high elevations on the Andes of New Grenada. Greenhouse treatment suits them, but their woolly or silky leaves must not be wetted. Pot firmly in sandy peat.

Principal Species :—

argentea, 6', Jy., yel. *neriifolia*, 8', sum., yel.
grandiflora, 12', Jy., yel.

EUCALYPTUS.

Description.—This is a large genus (*ord.* Myrtaceæ) of Australian trees, most of which attain to a

Other Species :—

amygdalina, 100', Je., wh. *leucoxylon*, 30', aut., ro.,
 (syn. longifolia). red (*syn. sideroxylon*).
calophylla, 50', aut., wh. *polyanthemos*, 30', aut.,
coccifera, 30', Dec., pur. wh.
ficifolia, 40', aut., crim. *tetragona*, 20', Jy., red.
gigantea, 100' to 400', *urnigera*, 30', Aut., gm.,
 aut., wh. wh.

EUCHÆTIS.

A greenhouse shrub (*ord.* Rutaceæ), closely allied to *Diosma*, and needing similar treatment. *Glomerata*, 1½', May, white, is a South African plant.



Photo : Cassell & Company Ltd.

ESCALLONIA LANGLEYENSIS (see p. 329).

EUCHARIDIUM.

Charming little hardy annuals (*ord.* Onagraceæ), very beautiful in borders or beds. They are raised from seeds sown on a hotbed in March or in the open in April or May. Common soil.

Principal Species :—

Breweri, 9", Je., lil., pur., — album, wh. or bluish.
 wh. *grandiflorum*, 1½', Je.,
concinnum, 1', Je., pur. ro., pur.

EUCHARIS.

Description.—Bulbous stove plants (*ord.* Amaryllidaceæ), furnished with large, broad-bladed leaves, and producing tall spikes of large, white, fragrant blooms. By far the most useful species is *grandiflora*, popularly known as *amazonica*.

Propagation.—By offsets and seeds, chiefly the former. Young bulbs are removed from the old ones whenever repotting is necessary, sorted, potted together in sizes, and plunged in the propagating house until root action becomes vigorous. Seed will ripen, but it strains the plant to produce it; sow in heat as soon as ripe.

Soil.—Rich loam, with the addition of peat or leaf mould, and some coarse sand.

Other Cultural Points.—Good drainage is essential. Potting is best done after flowering, but only then when more root room is absolutely

great height, and yield valuable timber or essential oil. The entire leaves are often of a glaucous hue, as in the case of *Globulus*, the Blue Gum tree. The flowers are, with few exceptions, unattractive, and only produced when the plants are of considerable size. Comparatively few species possess horticultural merit; all may be grown in a cool greenhouse; and in some sheltered parts of southern England, Ireland, and the warmer parts of Scotland, specimens will grow freely in the open for many years without suffering injury from frost.

Propagation.—Generally by seeds, but cuttings of firm growth root freely if placed in sandy soil, under a bell-glass, in early summer.

Soil.—Equal parts of peat and loam.

Principal Species :—

citriodora, 20', sum., wh., *Gunnii*, 50', aut., wh.
 Citron-scented leafage. *preissiana*, 20', aut., yel.
cornuta, 80', sum., red, *pulverulenta*, 50', Je., wh.
 yel. *resinifera*, 100', lvs. 4" to
Globulus, 150', aut., wh. 6".
 Blue Gum.

Espinosa (see *Eriogonum*).

Ethanium (see *Renealmia*).

necessary. Six bulbs are sufficient for a 10" pot. Established specimens respond to forcing in bottom heat and the application of fertilisers; by these means three crops of flowers per year may be obtained, but such treatment soon weakens the bulbs, and a collapse follows. A rest after flowering, induced by a reduction of the water supply and a few degrees less of heat, will go far to ensure continued health, but "drying-off" must not be practised. Assist established specimens by frequent applications of liquid cow manure during the flowering period.

Eucharis Mite.—This tiny insect (*Rhizoglyphus echinopus*) is found in abundance on the bulbs and roots of unhealthy *Eucharises*. Its presence

Principal Species :—

amazonica (see *grandiflora*).
candida, 16", aut., wh.
grandiflora, 2', Ap. to Dec., wh. (*syn. am-*

azonica) (see figure).
Lowii and *Moorei* are two slight variations from the type. *Fragrans* is also good.

Other Species and Hybrids :—

bakeriana, 1½', sum., wh.
burfordiensis, 1½', Sep., wh. (*Mastersii* × *Stevensii*).
Mastersii, 1¼', Feb., Mch., wh., grn.
Sanderi, 1¼', Mch., wh.,

pale yel. (*syn. sanderiana*).
 — *multiflora*, 1', Mch., wh., yel., grn.
Stevensii, 1¼', Mch., wh., pale yel. (*candida* × *Sanderi*).
subdentata, 1', win., wh.



EUCARIS GRANDIFLORA, GENERALLY CALLED AMAZONICA.

soon becomes observable when decay is induced by errors in watering, and by excessive stimulation to secure increased flower production. Wash unhealthy, mite-infested bulbs free from soil and insects, remove decayed portions with a sharp knife, and then place the bulbs in the following mixture: Potassium sulphide ¼ lb., dissolved in 3 gallons of water heated to 115°. Let them soak in this for fifteen minutes, and then place them on a sunny shelf in a stove or intermediate house to dry. Two or three weeks' drying will not be too much, provided a sheet of thin paper is placed over the bulbs for a couple of hours at midday during very bright, hot weather; no other shading must be given. Such treatment stops decay and kills the mites. Pot in a very sandy compost, to which broken charcoal is added. Plunge the pots where a moderate bottom heat is available, and, if the atmosphere is kept moist, watering will be neither necessary nor desirable until new roots and top growth have made good progress.

Euchilus (see *Pultenaea*).

EUCHLÆNA.

A tall, stately Grass (*ord. Gramineæ*), that has proved invaluable for fodder in tropical countries. It is a stove annual and needs rich soil and plenty of room.

Principal Species :—

mexicana, 10' to 15', aut., pur., grn. (*syn. luxurians*).

EUCHRESTA.

Greenhouse shrubs (*ord. Leguminosæ*), propagated by cuttings placed in bottom heat. Some species are valued by the Javanese for their bitter tonic properties.

Principal Species :—

Horsfieldii, 3', sum., wh. *japonica*, 3', sum., bl., wh.

EUCLEA.

South African plants (*ord. Ebenaceæ*), that suc-

Euchroma (see *Castilleja*).

ceed in the greenhouse, and are propagated by firm cuttings inserted in sandy soil in spring.

Principal Species :—

Pseudebenus, 6', wh. undulata, 6', wh.
racemosa, 6', wh.

EUCOMIS.

Strong-growing bulbs (*ord.* Liliaceæ) from South Africa; they are hardy enough to succeed in light soil in a sheltered spot, but in many places are best grown in the greenhouse. Rich loam is the best rooting medium. Give liquid manure freely during the season of growth, but withhold moisture when the plants are resting. Increase is by offsets.

Principal Species :—

punctata, 2', Aug., grn., regia, 2', Mch., Ap., grn.,
br. pur. (*syns.* *macrophylla*
and *clavata*).

Other Species :—

amaryllidifolia, 1½', Jy., grn. nana, 9", My., grn., br.
bicolor, 1', Jy., grn., pur. undulata, 2', My., grn.

EUCROSIA.

Ornamental greenhouse bulbous plants (*ord.* Amaryllidæ). Propagation, by offsets inserted in any light compost; the flowering bulbs require a substantial loam. The plants must have a distinct resting period.

Only Species :—

bicolor, 1½', Ap., sc. The reverse of the segments has a central green stripe.

EUCRYPHIA.

Pretty evergreen shrubs or trees (*ord.* Rosaceæ), some of which are hardy in mild districts, while the others require a little winter protection. They grow best in peat and loam, and are propagated by layers or cuttings of the young shoots in sand under a bell-glass.

Principal Species :—

Billardieri, shr. or tree, wh. cordifolia, 20', wh.
— *Milliganii*, smaller. pinnatifolia, 10', Aug.,
hlf-hdy., wh.

EUGENIA.

A large genus (*ord.* Myrtaceæ) of stove or greenhouse trees and shrubs, possessed of considerable economic value, the Rose Apples and Malay Apples being produced respectively by *Jambos* and *malaccensis*. Pot or plant in loam and peat or leaf soil. Cuttings of firm growths root best in a close case.

Principal Species :—

brasiliensis, 6', Ap., wh. (*syn.* *Jambosa vulgaris*).
caryophyllata, 20', sum., wh. Rose Apple.
wh. (*syns.* *aromatica* and *Caryophyllus aromaticus*).
Jambos, 25', sum., wh. (*syn.* *Jambosa malaccensis*). Malay Apple.
myriophylla, warm grh. or st., elegant (*see* figure).

Other Species :—

apiculata (*syn.* *Myrtus Luma*). *Luma* (now *Myrtus Luma*).
aquea, 20', sum., wh. *myrtifolia*, 10', sum., wh.
buxifolia, 6', sum., wh. *Pimenta* (now *Pimenta officinalis*).
jambolana, 20', Aug., wh. *Ugni* (now *Myrtus Ugni*).
javanica, 12', sum., wh. *zeylanica*, 12', sum., wh.

Eucnemis (*see* *Gorenia*).

Eucnide (*see* *Mentzelia*).

Eucodonia (*see* *Archimenes*).

Eudesmia (*see* *Eucalyptus*).

Eudolon (*see* *Strumaria*).

Eudoria (*see* *Gentiana*).

Enfragia (*see* *Bartsia*).

Euleucum (*see* *Corena*).

EULALIA.

Very ornamental plants (*ord.* Gramineæ) for borders or lawns, or for growing in pots or tubs for decorative purposes under glass. The correct name is now *Miscanthus*, but they are grown in gardens under the name of *Eulalia*. They grow in any good garden soil, and are propagated by division in spring.

Principal Species and Varieties :—

japonica, 5', pur. (correctly *Miscanthus sinensis*). — *univittata*, yel. band along centre of leaf.
— *foliis-striatis*, lvs. with zebrina, yel. bars across the leaf (*see* p. 336).
— a creamy central band. — *gracillima*, slender.



EUGENIA MYRIOPHYLLA.

EULOPHIA.

Terrestrial Orchids (*ord.* Orchidaceæ) from Africa and the East Indies. The pseudo-bulbs are thick and compressed, the leaves large, the spikes erect, and the flowers remarkable for the large-sized lip. Well-crooked pots or deep pans are suitable receptacles, and a good compost consists of fibrous loam, flaky leaf soil, small crocks, and a little broken charcoal. Potting should only be done when new growth commences. Give water freely when growth is vigorous, but sparingly at other seasons. South African species thrive in a warm greenhouse, but others in the stove.

Principal Species :—

dregeana, 1½', aut., maculata, 1', aut. pk.,
chocolate, wh. wh.
guineensis purpurata, st., saundersiana, 1½', sum.,
sum., ro. pur., magenta. grn., blk.

Other Species :—

gracilis, 1½', Jc., grn. pulchra, 1', sum., yel.,
Ledenii, 1', sum., red, par.
br., grn., scripta, 1½', sum., grn.,
Mackenzii, 1', sum., pk., yel., br.
wh. virens, 1', sum., grn.,
pur.

EULOPHIELLA.

Stove Orchids (*ord. Orchidaceæ*) of which only two species are known at present. They are allied to *Cyrtopodium*. A compost of two parts peat, one part loam, and one part broken crocks is suitable. The plants require plenty of moisture at all times, and must never be allowed to get dry at the root. Thrips are the most troublesome insects, and they must be kept in check by fumigation.

Only Known Species :—

Elizabethæ, lvs. 1' to 3' 3' to 4', st., ro. (*syn.*
long, Ap., st., wh. *Grammatophyllum rœm-*
peetersiana, flower scapes *plerianum*).

EUONYMUS. (SPINDLE TREE.)

Highly ornamental deciduous or evergreen shrubs or trees (*ord. Celastrinæ*), which can be adapted to many purposes in gardens. Some make pretty, low hedges, and others are very ornamental on walls. Dwarf species make good edgings. Some are of uncertain hardiness, but their cultivation is extending, with the result of proving that the endurance of a number is greater than has been thought. Propagation, by seeds sown in autumn and spring, but usually by cuttings of ripened wood in loam and sand in autumn. Common soil.

Principal Species and Varieties :—

atropurpureus, 6' to 14', but only a few can be
Je., hdy. deciduous, named as a guide.
pur. These are albo-mar-
europæus, 5' to 20', My., ginatus, aureo-margin-
hd., deciduous, wh. atus, Chouveti, and
— *foliis variegatis*, latifolius aureus.
japonicus, 6', Ap., wh. radicans, 1'; several vars.:
ev., hdy. except in cold with silver and gold
districts. The most variegated lvs. (Accord-
useful. There are ing to some authorities
many beautiful forms radicans is a var. of
with variegated lvs., japonicus).

Other Species :—

americanus, 2', Je., hdy. *hamiltonianus*, 6' to 20',
deciduous. Je., hlf-hdy. ev., wh.
bullatus, My., hlf-hdy. *latifolius*, 8', Je., hdy.
ev., pk. deciduous.
chinesis, 5', My., hlf- *nanus*, trailer, Jy., hdy.
hd., ev., pk. deciduous, grn. (*syn.*
echinatus, 10', My., hlf- *linifolius*).
hd., wh. — *foliis variegatis*.
fimbriatus, 12', My., hlf- *velutinus*, Je., wh.
hd., ev., grn. *verrucosus*, 10' to 18',
grandiflorus, 10', Ap., hlf- My., hdy. deciduous,
hd., ev., wh. grn.

EUPATORIUM.

Description.—A large genus (*ord. Compositæ*) of greenhouse and hardy plants, many of which are especially suitable for conservatory or border decoration. All the species are perennial, and bear their flowers in clusters of small heads.

Propagation.—By division, cuttings, or seeds. The hardy species succeed best in open positions in deep, rich soil, and should be lifted, divided, and replanted in October or March every second or third year. Greenhouse species are useful for flowering in spring and early summer; cuttings should be taken early and put in sandy soil under a bell-glass to root.

Soil.—Rich loam, leaf soil and sand.

Other Cultural Points.—Pot as required, keep free from green fly, and during the late summer

Euosma (*of Andrews, see Logania*),
Euothonæa (*see Heisteria*).
Eupetalum (*see Begonia*).

grow the plants in a cold frame, pinching them occasionally to ensure a shrubby habit. Cut back old plants immediately after flowering.

Principal Greenhouse Species :—

atrorubens, 1½', Jan., (*syn. Hebeclinium ian-*
Mch., red (*syn. Hebe-* *thinum*).
clinium atrorubens). *riparium*, 2½', spr., wh.
grandiflorum, 3', Ap., wh. *weimannianum*, 4', Oct.,
haageanum, 3', My., wh. Jan., wh. (*syn. odora-*
ianthinum, 2', Jan., pur. *tum*).

Principal Hardy Species :—

ageratoides, 4', Aug., wh. *aromaticum*, 5', Jy., Aug.,
(*see p. 335*). wh.
altissimum, 5', Aug., Sep., *cannabinum*, 4', Jy., pk.
blush. *purpureum*, 5' to 1', Aug.,
red, pur.

Other Species :—

coronopifolium, 3', Aug., *feniculaceum*, 1', Aug.,
hdy., wh. hdy., yel.

EUPHORBIA.

Description.—This large and interesting genus (*ord. Euphorbiaceæ*) is remarkable as much for its wide distribution as for its diversity of habit. The Spurge-worts, or Milk-worts, comprise trees, shrubs, climbers, succulents, and annual and perennial herbs. Some are stove, some greenhouse, and some hardy plants, but all have milky juice and flowers surrounded by more or less brilliant bracts.

Annuals.—Hardy annuals may be sown in warmth and subsequently planted out to flower, or sown in the open in April. Stove annuals should be sown early, and must not be crowded.

Shrubby.—A rich loam is essential to success with the shrubby stove and greenhouse species, and these are best propagated by cuttings taken, with a heel, from old, cut-back plants that have been gently forced into growth again.

Succulents.—These succeed in a warm greenhouse, potted in a mixture of loam, lime or mortar rubble, and sand. Cuttings must be allowed to dry, on a shelf, for several days before being placed in sandy soil, or they will decay.

Herbaceous.—These are chiefly hardy, and may be increased by division in autumn or spring, or by spring-sown seeds. Strong growers make good border plants.

Principal Species :—

Bojeri, 4', Nov., Dec., st., *grandidens*, 18', Jy. (*syn.*
sc. *arborescens*).
Candelabrum, 10', succu- *Lathyris*, hdy. *Caper*
lent, yel. *Spurge*.
Caput-Medusæ, 2½', Aug., *pilulifera*, 2', sum., hdy.
succulent. grn. (*syn. capitata*).
cereifloris, 2', Ap., suc- *pulcherrima*, 6', Sep., Jan.,
culent. sc., st. (*see Poinsettia*
flavicomma, 1½', Jy., Aug., for culture).
hdy. *punicea*, 6', Ap., st., sc.
fulgens, 3½', Aug., Jan., *splendens*, 4', spr., sum.,
st., sc. (*syn. jacquini-* *st.*, pale sc., very spiny.
flora).

Other Species :—

Antiquorum, 9', Ap., st. *lactea*, 4', Jy., wh., st.
aphylla, 2', sum., grh., ev. *lophogona*, 3', sum., st.
Apios, 8', Jy., hdy. *mamillaris*, 2', Jy., st.
arborescens (*see grandid-* *marginata*, 1', Je., hdy.
dens). *meloformis*, 1', Jy., st.
balsamifera, 1½', Je., grh., *oxystegia*, 3', sum., grn.,
ev. yel., st.
biglandulosa, 3', sum., st. *pendula*, 1½', sum., st.
canariensis, 18', Jy., st., *spinosa*, 2', Je., hdy.
ev. *tetragona*, 4', sum., st.
Characias, 4', Ap., hdy. ev.
jacquiniiflora (*see ful-* *uncinata*, 10", Jy., st.,
gens). ev.



Photo: Cassell & Company, Ltd.

EUPATORIUM AGERATOIDES (see p. 334).

EUPHRASIA.

Little hardy annuals (*ord.* Scrophularinæ) of practically no horticultural value. They grow in ordinary soil in the border, and can be sown in March or April.

Principal Species :—

lutea, 1½', Jy., pur. (now officinalis, 9", Jy., pur.
Bartsia lutea). (*syn.* alpina).

EUPOMATIA.

A greenhouse shrub (*ord.* Anonacæ) from Australia. *Bennettii* (*syn.* laurina), 4', summer, green

Principal Species and Varieties :—

japonica variegata, 4' to 6', grn., wh. foliage.
latifolia variegata, 4' to 6', pale grn., creamy wh. lvs. This is correctly referred by later authorities to *Cleyera Fortunei*, but the former name has become too firmly fixed, horticulturally, to be readily disturbed.

EURYALE.

One of the finest of tropical Water Lilies (*ord.* Nymphæacæ), and only second to the *Victoria Regia* in point of size. Like the latter, it should be



Photo: Chas. R. Bick.

EULALIA (correctly **MISCANTHUS**) *JAPONICA ZERRINA* (see p. 333).

and yellow, is evergreen, and can be increased by seeds or cuttings placed in sandy soil in spring, and given slight bottom heat. Peat and loam, with sand, form a suitable compost.

EURYA.

A small group of evergreen greenhouse shrubs (*ord.* Ternstroemiaceæ), all of neat habit. The variegated forms are invaluable for conservatory decoration, and one, known horticulturally as *latifolia variegata*, is extensively grown for market to meet the demand of floral decorators. Cuttings of short, well-ripened growths may be inserted in early autumn or spring, in sandy peat, and placed in a close propagating case. Fibrous peat and loam, with plenty of sharp sand, form a suitable compost. Growth is rather slow, both in the case of cuttings and established plants.

Euphoria (in part, see *Nephelium*).
Epodium (see *Marattia*).
Euphyrena (see *Timonius*).
Eurhotia (see *Cephaelis*).

raised annually from seed, and grown in rich soil in a tank or tub of warm water in a stove.

Only Species :—

ferox, Aug., red, pur.

EURYCLES.

Bulbous-rooted stove plants (*ord.* Amaryllidæ), that grow well in rich loam and leaf soil. They require a decided resting period, when no water is necessary. Treat like *Pancratiums*. Increase is by offsets or seeds.

Only Species :—

Cunninghamii, 1', Jy., wh.
sylvestris, 1½', Aug., wh. (*syns.* *amboinensis* and *australasica*).

Euryandra (see *Tetracera*).
Euryangium (see *Ferula*).
Eurybia (see *Olearia*).
Eurybiopsis (see *Vittadenia*).

EURYCOMA.

A small genus (*ord.* Simarubææ), of which the principal species is *longifolia*, 20', May, purple. It is an evergreen shrub requiring the temperature of a stove. The plant thrives in equal parts of loam and peat, and may be propagated by cuttings of ripe wood in very sandy soil, beneath a bell-glass over bottom heat.

EURYGANIA.

The only member of note in this genus is *ovata*, 4', July, crimson. It is a stove evergreen shrub (*ord.* Vacciniacææ), and is closely allied to the *Thibaudias*. Cuttings may be rooted in sandy soil beneath a bell-glass, or in a propagating case, and the best potting material is fibrous loam and peat in equal parts, with coarse silver sand.

EUSCAPHIS.

The white flowers of *Euscaphis staphyleoides* are followed by red fruits. It is an attractive, hardy Japanese shrub (*ord.* Sapindacææ), growing well in any fairly fertile soil. Increase is effected by cuttings under hand-lights, or by seeds.

EUSTEGIA.

A small genus (*ord.* Asclepiadææ). The chief species is *hastata*, a greenhouse evergreen trailer, producing white flowers in summer. It may be increased by cuttings in sandy soil, and grows best in equal parts of loam and peat.

EUSTOMA.

Of this genus (*ord.* Gentianææ) the only species are *russellianum*, 3', August, purple, a hardy biennial that may be raised from seeds in sandy soil over a mild hotbed in March, and subsequently transplanted to fertile soil in the open; and *silenifolium*, 2½', July, purple (*syn.* *exaltatum*). The latter is a greenhouse herbaceous perennial, increased by division.

EUSTREPHUS.

These evergreen twiners (*ord.* Liliacææ) are reputedly half-hardy, but do best under glass. They require care in watering, and grow best in fibrous peat and sand. Cuttings root freely in sandy peat.

Principal Species :—

latifolius, 3', Je., pur. (*syn.* *angustifolius*).

EUTAXIA.

A genus (*ord.* Leguminosææ) of greenhouse evergreen shrubs. *Myrtifolia* succeeds against an outside wall south of the Thames. Propagation is by cuttings in sand under a bell-glass, and the plants succeed in loam and peat; they must be pinched once or twice to ensure a bushy habit.

Principal Species :—

myrtifolia, 1½', Jy., or. *pungens* (correctly *Dillwynia pungens*).

EUTERPE.

A genus (*ord.* Palmææ) of handsome Palms requiring stove treatment. Some of the species attain to a great height, and are very graceful. From the fruits of *edulis* a foodstuff known as *Assai* is cooked, while the centre of the growing point of *montana* is cooked as a vegetable or

pickled. Propagation is effected by seeds, and the plants grow best in rich loam.

Principal Species :—

edulis, 80'. *oleracea*, 80'. *stenophylla*, 30'.
montana, 30'. *speciosa*, 30'. *sylvestris*, 50'.

EVENING PRIMROSE.

The common Evening Primrose, (*Oenothera biennis*), is of a rich primrose colour, and slightly fragrant. This species, with *fruticosa* var. *Youngii*, yellow, and *speciosa*, white, makes up a trio of beautiful plants. They are perfectly hardy. The first is a biennial and the others perennial species. (*See also* ENOTHERA.)

EVERGREENS.

A most useful and ornamental class of plants. As screens for more tender subjects, or for ugly places, such as tool sheds, stables, storehouses, etc., they are invaluable. Many a splendid estate would lose half its beauty were there no evergreen shrubs or stately evergreen, Coniferous trees to hide its blemishes.

A sandy, open soil, well worked to a depth of several feet, and enriched with plenty of well-decayed manure, should be selected where possible; as many of them are slow growing, and occupy the same ground for many years, the extra labour entailed in preparing the sites is not wasted. Trees or shrubs once planted should never be dug amongst; a light forking in the autumn to bury any decayed leaves, and to make the ground look neat and tidy, is all they require.

As regards pruning, it may safely be said that the less they receive the better, though where their boughs intrude on grass edges or walks an annual cutting is necessary. This, in the case of large-leaved kinds, such as Laurels and Aucubas, should always be done with a knife. With small-foliaged plants, such as Yews and Box, a pair of shears or sécateurs may be used.

Some of the most beautiful and effective evergreens, from among which a selection to meet nearly all requirements may be made, are as follow :—

Arbutus Unedo, the Strawberry Tree, which bears numerous creamy white flowers, and in favourable positions produces clusters of orange scarlet edible fruits.

Aucuba japonica maculata, the common, well-known Spotted Laurel, whose flowers need the presence of *Aucuba japonica maculata mascula* to convert them into the well-known clusters of scarlet fruits.

Azara microphylla, a useful shrub, but tender when young. It grows at least 15' high.

Berberis Aquifolium, *B. Darwinii*, and *B. stenophylla*, all flowering freely and yielding useful foliage.

Buxus sempervirens and *B. S. suffruticosa* (the Box), with the variegated forms.

Cerasus lusitanica (Portugal Laurel) and *C. l. myrtifolia* are useful. In sheltered spots the

Euthales (of R. Brown, see *Velleia*).

Euthamia (see *Solidago*).

Eutoca (see *Phacelia*).

Euxeris (see *Podanthus*).

Euzolus (see *Amaranthus*).

Evallaria (see *Polygonatum*).

Eransia (see *Iris*).

Evea (see *Cephaelis*).

Eurythalia (see *Gentiana*).

Eusipho (see *Cyrtanthus*).

Eustylis (see *Nemastylis*).

Eutaxia (see *Araucaria*).

Laurustinus (*Viburnum Tinus*) makes a good and free-flowering companion.

The common Laurel (*Cerasus Lauro-Cerasus*) and *C. L.-C. colchica* are both good and well known.

The Spurge Laurel (*Daphne Laureola*) and *D. Cneorum* are useful for front positions, and bear sweetly perfumed flowers.

The green and variegated *Euonymuses* are valuable for imparting colour, as are the golden and silver forms of the common Holly, of which Golden Queen and Silver Queen, though old, are still of the best. Even the green-leaved Holly (*Ilex Aquifolium*) is indispensable in a collection of evergreens.

The Brooms, with their evergreen stems, are useful in some situations, as is the curious plant called the Butcher's Broom (*Ruscus aculeatus*), whose bleached sprays make valuable winter ornaments for filling vases.

The Sweet Bay (*Laurus nobilis*) should not be omitted.

The American section of flowering evergreen shrubs, comprising *Kalmias* and *Andromedas*, should on no account be overlooked where the soil is, or can be made, of a peaty, sandy nature.

Among the Coniferous section of evergreens many suitable varieties or species are available, and the following are some of the most ornamental:—

Araucaria imbricata (Chilian Pine); *Thuya* (*Biota*) *orientalis* (Chinese Arbor-vitæ), with its golden form *T. o. aurea*; *Cupressus lawsoniana*, with its many beautiful varieties; *Cedrus Deodara*, perhaps the handsomest of all evergreens; and *C. Libani* (Cedar of Lebanon), with its vars.

Cupressus (*Retinispora*) *pisifera*, *C. p. squarrosa*, *C. obtusa*, *C. plumosa*, and *C. filifera* are all pretty and dwarf. *Cryptomeria japonica* and its vars., *elegans* and *Libbi nana*, should be in every garden.

Taxus baccata, the English Yew, and *T. b. fastigiata*, the Irish Yew, are too well known to need recommendation, while many species and varieties of *Pinus*, *Picea*, *Juniperus*, *Thuya*, and *Abies* may be pressed into the planter's service.

The various evergreens are dealt with under their particular names.

EVERLASTING PEAS (see also LATHYRUS).

Under this heading there might well be grouped all the perennial species of *Lathyrus*, but from a purely horticultural point of view the description applies only to *latifolius* and its varieties. These are strong growers, and easily increased by division, or from seeds in autumn or spring. They love a substantial, moist rooting medium, as in this they produce strong, climbing growths and an abundance of many flowered spikes. The adjective "everlasting" does not apply to the latter; it is simply used to differentiate between this perennial and the many annual species. Florists have not been so successful with *latifolius* as with *odoratus*, nevertheless their patience and persistence have been rewarded by the production of several pretty colour variations. The rosy red type is well known, and the pure white form *latifolius albus* is also very popular. To these may now be added such tinted varieties as *delicatus*, and richly hued forms like *splendens*, while shades of salmon and purplish rose are on the market.

Evergreen Thorn (see *Crataegus Pyracantha*).

EVERLASTINGS.

Quite a number of genera produce flowers with stiff, papery, persistent florets, so that for the several species of "Everlastings," or Everlasting Flowers, reference must be made particularly to *Acroclinium*, *Gnaphalium*, *Gomphrena*, *Helichrysium*, *Phœnocomia*, *Rhodanthe*, and *Statice*. It is chiefly upon *Acroclinium* and *Helichrysium*, hardy annuals, that dependence is placed for flowers that will preserve their form, grace, and colour when dried, for winter decorations. Florists have produced a number of beautiful *Helichrysums* that are very double, and vary in colour from white through silver, cream, yellow, orange, brown, and crimson, to purple. The best method of preserving Everlasting flowers is to cut them while quite dry, just before the heads open out to expose the central florets. Having cut and neatly bunched the flowers, suspend them head downwards in a dry and comparatively cool place, as sun or artificial heat will cause the blooms to expand fully, when they will not be so beautiful or likely to last so long. Other points are to secure stems as long as possible, and dry the flowers where dust will not spoil the lighter colours. Though these Everlasting flowers will last a couple of years or more, it is best to dry a fresh stock each summer.

EVODIA.

A small genus (*ord.* Rutaceæ) of stove evergreen shrubs. The most notable species is *triphylla*, 6', May, white. It grows best in light sandy loam, and may be increased by cuttings in sand beneath a bell-glass over bottom heat.

EVOLVULUS.

A group of drooping plants (*ord.* Convolvulaceæ), mostly stove annuals or perennials, with blue flowers. All are readily raised from seed, and require a rich loam to grow in.

Principal Species:—

latifolius, 2', Je., wh. *purpureo-cœruleus*, 2', Jy., dark bl.

EXACUM.

A small but useful genus (*ord.* Gentianæ) of annual or perennial plants, that thrive in either an intermediate temperature or a greenhouse. The annual species, *zeylanicum macranthum*, needs the warmer treatment, and even then it is more biennial than annual. Seeds must be sown in heat. As the seedlings are apt to damp quickly, good drainage and careful watering are essential. For compost use fibrous loam, peat, leaf soil, and sand. Perennial species like the sweet-scented *affine* are increased by cuttings placed in sandy soil and given bottom heat.

Principal Species:—

affine, 6" to 9", win., *macranthum* (see *zey-*
spr., pur., vio. *lanicum macranthum*).
Forbesii, 1' to 1½', win., *zeylanicum macranthum*,
spr., intermediatehouse, 2½', aut., rich vio., pur.
vio., sweet.

Other Species:—

bicolor, 1', Je., pur. *Walkeri*, 1½', Feb., bl.
tetragonum, 1½', Aug., *zeylanicum*, 2', aut., pur.
bl.

EXOASCUS.

A troublesome genus of fungi. *Deformans* causes the "Peach Blister," which see.

Evodia (of Gertner, see *Ravensara*).

Euonymus (see *Euonymus*).

EXOCHORDA.

Very ornamental hardy shrubs (*ord.* Rosaceæ), well adapted for growing on walls and in the milder districts in the open. The flowers are of fair size and very beautiful. They are succeeded by curious fruits. Any good garden soil. Propagated by layers or suckers, or seeds sown in spring.

Principal Species :—

Alberti, 6', My., wh. grandiflora, 6', My., wh.

EXOSTEMMA.

A genus of stove evergreen trees (*ord.* Rubiaceæ). The plants thrive in loam and peat, and may be increased by cuttings in sand under a bell-glass over bottom heat.

Principal Species :—

longicollum, 30', Je., wh.

EYSENHARDTIA.

A small genus (*ord.* Leguminosæ), amorphoides, 12', June, pale yellow, being the only notable species. It is a half-hardy evergreen shrub, growing in equal parts of loam and peat; propagation is by cuttings in very sandy soil over gentle bottom heat.

FABA.

Now referred by botanists to *Vicia*. (For culture, varieties, and enemies, see BEANS.)

FABIANA.

The one species of note in this genus (*ord.* Solanaceæ) is *imbricata*, 2', May, white (*see* figure). It is an evergreen shrub, which thrives in the greenhouse, and will succeed out of doors in favoured localities. Propagation, by cuttings under a bell-glass over gentle bottom heat. Fibrous peat and coarse sand suit it.

FADYENIA.

A very small genus (*ord.* Filices) of stove Ferns, *prolifera*, 6", being the principal species. It thrives in a mixture of loam, peat, and sand. Propagation, either by spores, or by pegging down, and subsequently severing from the parent, the little plants that form at the tips of otherwise barren fronds.

FAGELIA.

The best known member of this genus (*ord.* Leguminosæ) is *bituminosa*, 4', June, purple, yellow. It is a greenhouse evergreen twiner, and may be increased by cuttings of the tips beneath a bell-glass. Soil, fibrous peat and loam, broken to pieces and the finer particles removed (*syn.* *Glycine bituminosa*).

FAGOPYRUM.

A small but important genus (*ord.* Polygonaceæ), as in *esculentum*, 3', summer, pink, we have the Buckwheat of commerce. Another fairly well-known species is *cymosum*, 2', July, pink. Both are hardy annuals. Propagation, by seeds. Any fertile garden soil. Frequently grown under the name of *Polygonum*.

Exogonium (*see* *Ipomœa*).

Exothostemon (*see* *Prestonia*).

Eyebright (*see* *Euphrasia*).

Eyrea (*of* Champ, *see* *Turpinia*).

Fabago (*see* *Zygophyllum*).

Fabricia (*of* Adanson, *see* *Lavandula*).

Fabricia (*of* Thunberg, *see* *Curculigo*).

Fadyenia (*of* Endlicher, *see* *Garrya*).

Fagara (*see* *Xanthoxylum*).

FAGRÆA.

A genus (*ord.* Loganiaceæ) of evergreen shrubs and trees. Propagated from cuttings beneath a bell-glass over bottom heat. Soil, equal parts of loam and peat.

Principal Species :—

zeylanica, 12', sum., st., wh.

FAGUS (*see also* BEECH).

Handsome trees, mostly deciduous, and, with the exception of a few species from Australia and New Zealand, all perfectly hardy. The leaves are usually shining green, but varietal forms with copper or purple foliage make splendid garden or park specimens. Beeches succeed where any other



FABIANA IMBRICATA.

hardy tree thrives. Propagation, by seeds sown either in autumn or spring; garden varieties by grafting in spring.

Principal Species and Varieties :—

Cunninghamii, 30', ev.,	— cuprea.
grh.	— heterophylla (<i>syn.</i>
ferruginea macrophylla,	comptoniaefolia, incisa,
30' to 100'.	laciniata, and salici-
sylvatica, 80'.	folia).
— atropurpurea.	— pendula.
— aureo-variegata.	— purpurea.

Other Varieties :—

sylvatica cristata.	— quercoides (<i>syn.</i> querci-
	folia).
	— variegata.

FAIRY RINGS.

Caused by fungi, often *Agaricus arvensis*. Starting with one sporeling, they spread their mycelium underground so as to cover a small circle, at the circumference of which a crop of Toadstools (the

Fair Maids of France (*see* *Ranunculus acronitifolius flore pleno*).

fruiting stage of the fungus) appears in due course. Near the circle the grass assumes a deep hue, produced by the rich nitrogenous food it secures from the decaying toadstools.

FALKIA.

The only member of note in this genus (*ord.* Convolvulacæ) is repens, a greenhouse evergreen creeper producing pink flowers in July. Soil, loam and peat. Propagation, by cuttings beneath a bell-glass in gentle heat.

FALLOWING.

Roughly digging land, and leaving it exposed to the ameliorating action of the elements.

FALLUGIA.

A small genus (*ord.* Rosacæ) of hardy shrubs, of which paradoxa, 3', July, white, is the best known (*syns.* Fallugia mexicana and Sieversia paradoxa). It is a fine plant with erect branches. Protection should be afforded in cold localities. Propagation, by cuttings under hand-lights. Soil, sandy loam.

FARADAYA.

A genus (*ord.* Verbenacæ) comprising amongst the species two white flowered stove climbers named respectively papuana and splendida, the latter fragrant. Propagation, by cuttings beneath a bell-glass over bottom heat; or by seeds when procurable. Soil, good loam.

FARAMEA.

The principal member of this genus (*ord.* Rubiacæ) is odoratissima, 6', May, white, fragrant. Propagation, by cuttings. Soil, fibrous loam and peat, with coarse sand.

FARFUGIUM (see SENECIO).

FARMYARD MANURE (see MANURE).

FARSETIA.

Little grown, but pretty, hardy, or half-hardy plants (*ord.* Cruciferæ), of herbaceous or sub-shrubby habit. Any good soil. Propagation, by seeds sown in a frame in spring; the sub-shrubby species also by cuttings under a hand-light. They resemble the Alyssums, and generally have hoary foliage.

Principal Species :—

ægyptia, 1', Jy., wh. (*syn.* clypeata, 1½', Je., yel. ægyptiaca). (*syn.* cheiranthifolia). suffruticosa, 1', My., vio.

FATSIA.

This genus (*ord.* Araliacæ) is notable mainly because it comprises the species japonica, beloved of room gardeners. It is a half-hardy shrub. Propagated by cuttings. Any light soil. In favoured positions it is quite hardy, and attains to a considerable size (*syn.* Aralia Sieboldii). There are variegated forms. Economically, the value of

False Acacia (see Robinia Pseudacacia).
False Asphodel (see Tofieldia).
False Bugbane (see Trautvetteria palmata).
False Dittany (see Dietamnus).
False Hellebore (see Veratrum).
False Mitrewort (see Tiarella cordifolia).
False Rhubarb (see Thalictrum flavum).
False Sandalwood (see Ximenia americana).
Fan Palm (see Chamerops and Corypha).
Farnesia (see Acacia).

the genus lies in papyrifera (*syn.* Aralia papyrifera), from whose pith the Chinese manufacture the celebrated Rice paper.

FEDIA.

An annual (*ord.* Valerianæ). Sow in the border late in April or early in May, or in pots under glass early in March. It grows in common soil in a sunny position. Other plants formerly called Fedia are now called Valerianella, which *see*.

Only Species :—

Cornucopiæ, 9", Jy., red (*syn.* Valeriana Cornucopiæ).

FEIJOA.

A Brazilian genus (*ord.* Myrtacæ) of shrubby habit, with leathery, evergreen leaves and large white flowers with prominent red stamens. The flowers are succeeded by edible fruit. The only species is sellowiana, a large bush which flowers in early summer. It is increased by cuttings or layers, and rejoices in a mixture of good peat and loam and an intermediate temperature.

FELICIA.

A genus (*ord.* Compositæ) comprising a hardy annual and several greenhouse evergreens. Propagation, by cuttings under a bell-glass, except fragilis. Soil, three parts of loam, one part of peat, and coarse sand.

Principal Species :—

angustifolia, 3', My., lil. fragilis, 2', Jy. to Sep.,
echinata, 1', My., yel. ann. or bien. hlf-hdy.,
reflexa, 3', Je., red, wh. vio. (*syn.* tenella).

FENCES.

Preferably constructed of living materials in the garden, among which Yew, Box, Cupressus, Privet, Holly, Hawthorn or Quickset, and Berberis may all be suitably and satisfactorily employed. An annual-clipping will tend to keep these trim, and also keep the bottom of the fence well clothed. Iron hurdles, covered with wire netting, to which creepers may be trained; split Oak and split Larch; and walls built of brick burrs, are all suitable where a dead fence is desired.

FENDLERIA.

A neat but rather tender shrub (*ord.* Saxifragæ). Propagated by seeds sown under glass in spring; by cuttings in summer; or by layers. Except in warm localities it should have the protection of a wall.

Only Species :—

rupicola, 4', sum., wh.

FENNEL.

The Common Fennel (Feniculum vulgare) grows 3' to 6' high, and if frequent propagation is not desirable the plant must not be allowed to flower.

Feaberry (see Gooseberry).
Feather Grass (see Stipa pennata).
Fedia (of Adanson, see Patrinia).
Fedia (of Gærtner, see Valerianella, in part).
Feva (see Trichomanes spicata).
Felwort (see Swertia).
Fennel Flower (see Nigella).
Fennyreek (see Tigonella).
Fenzlia (see Gilia).

Increase is by seeds sown in drills in the autumn. From Fennel the aromatic and stimulative Oil of Fennel is expressed.

FERNERY.

The outdoor Fernery is an increasingly popular feature in British gardens. It should be in a partially shaded spot, but must not be too thickly

soil. It is a capital plan to plant Scillas, Snowdrops, Daffodils, and other bulbs between the Ferns, as these flower while the earth is bare.

The indoor Fernery should be divided into three sections. (1) For the tropical species and varieties, which need a temperature of not less than 58° by night in winter, and 70° to 75° by night, rising to 80° during the day, in summer. (2) The cool



A PRETTY CORNER IN A FERNERY, FROM A PHOTOGRAPH SUPPLIED
BY MRS. BARDSWELL.

overhung with trees, for although Ferns do not like direct sunshine, they want plenty of diffused light. The soil should be light, but rich, and a loam of medium texture, with plenty of humus, is an ideal compost. Leaf soil may be added subsequently. Plenty of water is necessary all through the growing season, which extends, roughly, from April till October. A few pieces of sandstone inserted here and there help not only to break up the monotony of a level surface, but also to add porosity to the

Fernery, with a winter minimum temperature of 40°, and kept as cool as possible during the summer, (3) A house for Filmy Ferns, which need the atmosphere to be always nearly at saturation point. An underground cave is an excellent place for such a Fernery. (See also FERNS.) All Ferneries should be glazed with clear glass, the necessary shading being given by blinds or a stippling of whitening on the glass. Ferns look more natural when planted out in nooks and crannies in the rockwork than they do in pots, but plants of delicate constitution are apt to come off badly in that they have to be treated the same with regard

Ferdinanda (see *Podochonium* and *Zalzuzania*).
Fernandezia (of Lindley, see *Lockhartia*).

to water as more vigorous subjects. When nicely arranged, bold masses of tufa, planted with suitable species and varieties, have an excellent effect. (For further particulars, see FERNS.)

FERNS.

A very large and important family of plants (*ord.* Filices), containing upwards of 3,500 species, and many thousands of varieties. They are distributed all over the globe, although they find their headquarters in tropical America and tropical Asia. Even the Arctic zone is not excluded. They are found at all elevations, from 10,000' to 12,000' in the Tropics, down to the sea level. Many varieties, particularly of hardy Ferns, have originated under cultivation, and these, with the recognised species, go to make up an immense variety of habit, size, shape, cutting of the fronds, and even colour. Between one and two thousand species are in general cultivation. On the whole, Ferns thrive best in spots shaded from direct sunlight. Plenty of diffused light is a necessity. All Ferns have their resting periods, when a lower temperature, and less water at the root, are advisable.

Methods of Culture.—Ferns may be grown in a variety of ways. Pot culture is at once handy and reliable, and almost all of the plants do well in pots if given the requisite temperature. Hanging baskets are very suitable receptacles for a considerable number, and such baskets are great acquisitions to any Fernery or conservatory. The baskets may be of wood spars, strongly jointed together with wire, or they may be of wire. The latter are rather more lasting. In any case a lining of sphagnum moss or, better still, of freshly cut turves with the grass side turned inwards, should be given. These baskets should be dipped regularly; twice a day is sometimes necessary during hot weather. A list of Ferns suitable for baskets is given at the end.

Ferns on Tree Stumps.—Some Ferns take very kindly to stumps of rough, unbarked wood, and form artistic additions to the Fern houses. Of the number may be mentioned the *Platycerium*, or Stag's Horn Ferns, which should be grown in pockets filled with compost; *Blechnum brasiliense*, and several of the *Davallias*, whose creeping rhizomes want little, if any, soil, but may simply be packed in with a little live sphagnum moss. The various species of *Nephrolepis* do well in pockets of virgin cork filled with soil.

Filmy Ferns constitute a distinct section of the family as far as treatment goes. They need plenty of water, but resent it overhead; hence the atmosphere should be kept as nearly as possible at saturation point. Where they are grown in the same house as the other Ferns they should be kept in a case, where they may be planted on portions of tree stumps, in crevices of rockwork, or on blocks of coarse, fibrous peat. The genera *Todea*, *Hymenophyllum*, and *Trichomanes* contribute the bulk of the **Filmy Ferns**.—The beautiful, but rather intractable, *Asplenium marginatum* does well under similar conditions.

Fern Walls.—A pretty Fern wall may be made by nailing pockets of virgin cork to the wall, and filling these with soil for the reception of the Ferns and Selaginellas. Another method is to fasten sheets of coarse mesh wire so that they stand 4" or 5" away from the wall, this space

being filled up with soil, and the Ferns planted in it. Almost all Ferns, save the *Gymnogrammes* and the more tender of the *Adiantums*, are available.

Fern Balls (see *DAVALLIA*).

In Porous Bottles.—The Madeira Fern bottles are made of very porous material. Before planting them with Ferns they are covered with a layer of clay about $\frac{3}{4}$ " thick, and this is kept in place by rings of copper wire. Very small sporelings only are planted, and all the attention that is subsequently necessary is to keep the pitchers filled with water.

Manures.—The idea was at one time very widespread that Ferns did not require stimulants of any sort. That this is erroneous, however, has been abundantly proved in practice. Still, Ferns like their stimulants weaker than do most other plants, and should only receive them during the height of the growing season. Withhold all manures of whatsoever nature in winter. Cow liquor and soot, diluted until it is light brown in colour, is the best natural manure.

Insect Pests.—In addition to the troublesome snowy fly (*Aleyrodes vaporariorum*) and thrips, Ferns have to contend with several inveterate enemies. Thrips may be got rid of by light fumigations, and snowy fly by careful sponging with soapy water. Brown and white scale are more troublesome than either. They have a knack of getting down amongst the crowns of *Adiantums*, and nothing but careful overhauling during the winter, when most of the fronds have been cut off, will ensure cleanliness for the ensuing summer. Sponge and brush must be plied vigorously in the winter both for scale and mealy bug. Cockroaches are a great nuisance in many Ferneries, eating off the young fronds as fast as they appear. The best method of dealing with them is to lay down phosphor paste, which they eat greedily. If weevils and slugs give trouble they must be caught at night time, for they are both night feeders.

Propagation.—The propagation of Ferns is an interesting occupation. Two generations go to make up the life of the Fern, the plant which is popularly regarded as the Fern being the second generation. The spores, upon germinating, produce a flat, cushion-like plate known as the prothallus, and upon these prothalli the minute male and female organs, antheridia and archegonia, are borne. The fusion of these two elements gives rise to the second generation, a much taller and a more handsome plant. From the foregoing it will be seen that the hybridising and cross-breeding of Ferns is a comparatively haphazard proceeding. Crosses have been effected by immersing the pan containing the prothalli in tepid water for a few minutes, the fluid acting as a vehicle for the transmission of the microscopic male bodies.

Ferns for Special Purposes:—

By referring to the various genera, and consulting the lists of principal species in each, it will be quite easy to pick out a selection for cool and warm houses, and for the hardy fernery.

For Windows.—*Aspidium falcatum*, *Asplenium bulbiferum*, *A. b. fabianum*, *A. b. minus*, *Adiantum cuneatum*, *Nephrodium molle*, *Pteris cretica*, *P. c. cristata*, *P. c. c. nobilis*, *P. c. Wimsettii*, *P. serrulata*, *P. s. cristata*, *P. tremula*, and *P. t. smithiana* are all suitable. There are others, but these are fairly easy to grow.

For Baskets.—*Adiantum Capillus-Veneris* and varieties, *A. caudatum*, *A. ciliatum*, *A. Edgeworthii*,

Fern Rue (see *Thalictrum flavum*).

Asplenium bulbiferum fabianum, *A. flaccidum*, *A. caudatum*, *A. longissimum*, *Davallia bullata*, *D. b. Mariesii*, *D. b. M. cristata*, *D. elegans*, *D. fijiensis*, *D. hirta cristata*, *D. mooreana*, *Gymnogramme schizophylla gloriosa superba*, *Hypolepis distans*, *H. tenuis*, *Nephrolepis exaltata*, *N. davallioides furcans*, *N. cordifolia*, *N. pluma*, *Platynerium alci-corne*, *Polypodium subauriculatum*, *Pteris serrulata* and its crested varieties, and *Woodwardia radicans*. There are many more.

FERONIA.

A stove evergreen tree (*ord.* Rutaceæ) chiefly grown for its fruits, known as Elephant Apples

FERTILISATION.

The fusion of the male and female elements produced by the flowers, hence the result of pollination, or the deposition of the pollen upon the stigma of the pistil.

Fertilisation is brought about in a variety of ways. It may be (1) natural, or (2) artificial. Artificial pollination becomes necessary with cultivated plants that are grown out of their natural season. Thus Peaches under glass which flower early in the year have to be "brushed" by hand because the bees that would perform the work later in the year are still in the enjoyment of their winter rest. A very light touch is sufficient



Photo: Cassell & Company, Ltd.

FICUS PARCELLI (see p. 344).

or Wood Apples. Both leaves and flowers are fragrant. Propagation, by cuttings of firm shoots in spring. Peaty soil.

Principal Species:—

Elephantum, 40', Ap., wh.

FERRARIA.

Quaint and interesting greenhouse, bulbous plants (*ord.* Iridææ). Increased by offsets or seeds. Soil, peat or leaf mould, loam, and sand. In favoured districts they may be grown out of doors on a well-drained, sheltered border.

Principal Species:—

<i>Ferrariola</i> , 8", sum., grn.,	<i>undulata</i> , 8", spr., grn.,
br. (<i>syns.</i> <i>antherosa</i> ,	br. (<i>syn.</i> <i>punctata</i>).
<i>viridiflora</i> , and <i>Moræa</i>	<i>Welwitschii</i> , 1', Jy., yel.
<i>Ferrariola</i>).	

Ferreola (see *Maha*).

to transfer the pollen; if the operator is heavy-handed the tender organs are bruised, decay ensues, and the prospects of fruit vanish. With Tomatoes and Vines a slight tap given to the stems of the plants at midday is usually sufficient.

Melons must be fertilised; Cucumbers need not. Unfertilised Cucumbers contain no seeds, but this is really an advantage for culinary purposes.

FERULA. (GIANT FENNEL.)

Handsome herbaceous plants (*ord.* Umbelliferae) with graceful foliage. *Fœtida* yields the *Asa-fœtida* of commerce, and the juice of the root of *Sumbul* is also used medicinally. Propagation, by division in spring, or by seeds sown, preferably under glass, at the same season. Any common soil, preferably rather damp.

Ferulago (see *Ferula*).

Principal Species :—

communis, 6' to 12', Je., yel.
 glauca, 6', Je., yel.
 — candelabrum,

Other Species :—

Asafetida, 7', Jy., yel.
 caspica, 4', Je., yel.
 Ferulago, 8', Je., yel.
 gigantea, 10', Je., yel.
 jaskkenna, Jy., yel., wh.
 (syn. fetidissima).
 Linkii, 6', Jy., yel.

tingitana, 8', Je., yel.
 Scarcely so hardy as
 the foregoing in some
 districts.

Narthex, 8', Jy., grn., yel.
 (syn. Narthex Asa-
 fetida).
 orientalis, 3', Jy., yel.
 sulcata, 5', Jy., yel.
 Sumbul, 9', Jy., yel. (syn.
 Euryangium Sumbul).

FESTUCA.

This genus (*ord.* Gramineæ) owes its value to the inclusion of ovina and duriuscula, both of which are pasture Grasses of excellent quality. They find a place in every mixture of Grass seeds for permanent pasture.

FEVERFEW (*see* CHRYSANTHEMUM [*syn.* PYRETHRUM] PARTHENIUM).

FEVILLEA.

Evergreen stove climbers (*ord.* Cucurbitaceæ) that grow luxuriantly. Propagation, by summer cuttings beneath a bell-glass over bottom heat

Principal Species :—

cordifolia, reddish. Moorei, reddish.

FICUS (*see also* FIG).

A very large genus (*ord.* Urticaceæ). In habit the plants show a wonderful diversity. Ficus elastica, the Indianrubber Plant, needs no recommendation, and its variegated form is deserving of increased popularity. For clothing back walls in greenhouses, there is hardly anything better than the clinging and climbing repens (correctly pumila, *syn.* stipulata), which is also useful for covering rock-work. The newer radicans variegata is a beautiful drooping plant eminently suitable for basket culture in the stove. Though not a particularly shapely plant, Parcelli, with its showy variegated leafage (*see* page 343), makes a fine stove specimen if carefully treated. Peat, loam, and sand form a suitable compost. Firm potting must be insisted upon. Propagation, by layers or cuttings. The latter may be of firm growths, allowing the cut ends to dry somewhat before insertion, or, as in the case of elastica, of one joint with leaf attached; a close, moist case and bottom heat are essential to success. The last-named species adapts itself to the process known as "ringing" when tall and bare stemmed; this consists in making a ring just below the lowest leaves and tying damp moss to the part so treated until roots are formed, when the head is removed and potted.

Principal Species and Varieties :—

bengalensis. Banyan Tree.
 Carica (*see* Fig).
 elastica, grn. lvs.
 — variegata, variegated
 lvs.
 erecta Sieboldii, dark grn.
 lvs. and yel., red fruits.
 Parcelli, pale grn. lvs.
 variegated with grn.
 and creamy wh. (*see p.*
 343.)
 pumila, small lvs., grn.
 creeper, nearly hdy.
 (syn. repens and stipu-
 lata).
 — minima, tiny leafage
 and close growth (*syn.*
 repens minima).
 radicans variegata, silvery
 variegation on small lvs.
 repens (*see* pumila).
 stipulata (*see* pumila).

Ficocort (*see* Triosteum).

Ficaria (*see* Ranunculus).

Fiddle Wood (*see* Citharexylum).

Other Species :—

altissima, 12'.
 Benjaminia, 12'.
 capensis, 4'.
 heterophylla, 20'.
 infectoria, 18'.
 macrocarpa, 24'.
 macrophylla, 20'. Aus-
 tralian Banyan.
 religiosa. Popul Tree.
 Roxburghii, 25'.
 Sycamorus, 10' (*syn.* Sy-
 camorus Antiquorum).

FIELDIA.

A climbing greenhouse plant (*ord.* Gesneraceæ) that succeeds in peat, loam, and sand, and is readily propagated by cuttings of firm side growths, placed over gentle bottom heat. Australis, 6', July, white, climbs by means of its stem roots like the Ivy.

FIG.

Description.—A prominent member of the genus Ficus, interesting as to its history, and highly esteemed for its delicious fruit.

Propagation.—This may be effected from seeds, layers, buds, grafts, and cuttings, the last named being, perhaps, the best for general purposes. Pieces of ripe wood, each having two buds, inserted in January or February in gentle heat, root very freely. If the plants are to be grown in pots, the cuttings must be potted singly as soon as they are well rooted. If only a few plants are required, cuttings of ripe one year old wood, with a heel, having all the buds removed from the portion that is to be inserted within the soil, are the best. Cuttings should in all cases be taken when the plants are at rest.

Soil.—Figs will flourish in any fertile soil containing lime, but it must always be made firm, as looseness tends towards gross, luxuriant growth that is never fruitful. The Fig likes moisture, but not stagnation, and the drainage should therefore be perfect. An ideal soil is calcareous loam, containing flints, and on a chalk subsoil.

Other Cultural Points.—Planting should be done when the leaves turn yellow in autumn. The Fig produces two and sometimes three crops in a season, and the pruning must be done with this fact always in mind. The first crop is on the previous year's wood, and the second and third in the leaf axils of the current season's growth. Pruning, therefore, should be limited to keeping the trees within proper space. Prune away all superfluous wood after the fruit is harvested, and the cuts will quickly heal over. Summer pruning consists in the removal of those shoots which shade their neighbours, as perfect maturation of all parts is essential to fruit development. Root pruning must be resorted to where growth is made at the expense of fruit. (For particulars, *see* PRUNING.) Root restriction is essential. Top-dressing is very advantageous to fruitful trees, and watering is necessary in dry weather to assist swelling.

A Selection of Varieties :—

Varieties of Figs are numerous, and for a collection several must be grown. If one is required, Brown Turkey is unquestionably the most reliable and the easiest to manage. For excellence of quality Grizzly Bourjasotte can scarcely be excelled.

For Outdoors :—

Angelique, Brown Turkey, White Marseilles.

For Forcing :—

Brown Turkey. St. John's (very early), White Marseilles, Negro Largo, Nebian (late).

FIGURE OF EIGHT MOTH.

Although it chiefly attacks Hawthorn and Blackthorn trees, the caterpillar of this moth (*Diloba cœruleocephala*) feeds also upon Apple and Plum trees. The brown and white insects, which owe their name, "Figure of Eight," to the arrangement of spots upon the wings, are to be seen in September. The eggs hatch in the following April. The caterpillars are blue-grey, or blue-green, with a blue head, and a yellow stripe along the back;

Avellana (ord. *Cupuliferæ*), which have arisen chiefly through high cultivation and selection.

Propagation.—Four methods are practised: Seeds, layers, suckers, and grafting. Of these, layering and grafting are the best. For layering, own-root plants should be set apart and cut back to the ground. The young shoots which grow should then be layered when 2' or so long. These when rooted should have all the lower buds removed, leaving a clear stem of $1\frac{1}{2}$ '. Suckers



Photo: Cassell & Company, Ltd.

THE SHORT-BLOSSOMED FLAME FLOWER, *KNIPHOFIA BREVIFLORA* (see FLAME FLOWER and *KNIPHOFIA*).

they are usually fully fed by the end of May. The best remedy is to spray with Paris Green at the rate of 1 oz. to 20 gallons of water. The moths may also be easily caught after dark if search be made for them with a bright light, such as that from a good cycle lamp.

FILBERT.

Description.—A name applied to one of the several distinct forms of the common Nut, *Corylus*

may be taken off in spring, and treated in a similar way to layers.

Soil.—Good, open loam, naturally well drained, though heavier or more gravelly soil also suits.

Other Cultural Points.—When forming a plantation, high rather than low ground is to be commended, and if a sheltering belt of trees can be allowed, so much the better. The plants should be set out 10' apart each way.

Pruning.—Each plant should form a miniature tree with about twelve main branches, the centre always being kept open. The annual pruning

Fig Marigold (see *Mesembryanthemum*).

Figwort (see *Phygelius capensis* and *Scrophularia*).

consists of thinning, shortening branches, and shaping. This should be done in February and March when in flower. The male and female flowers are from separate buds, the former being in conspicuous yellow catkins, the latter in small globular buds with a few red styles showing. It is important that the pruner should observe these when at work. An occasional dressing of the ground with lime or rotten manure will be found beneficial.

Insects.—The Nut weevil, *Curculio Nucum*, is the worst. The females crawl over the bushes in May and lay an egg in each young fruit; the egg produces a grub, which feeds on the Nut. Shaking off and burning infested fruits in July and August help to check the pest for the succeeding year.

Principal Species :—

Lambert's Filbert (*syns.* White Filbert (*syns.* Lambert's White, Wrotham Park).
 Filbert Cob, Kentish Cob).
 Red Filbert (*syns.* Lambert's Red, Red Hazel).

FINGER AND TOE (*see* CABBAGE—CLUB ROOT).

FIR.

A name popularly applied to numerous Conifers, species of *Abies*, *Picea*, *Pinus*, *Pseudotsuga*, etc., all being included under the title. A list of the principal Firs, with their correct names, is given below; for details see the respective genera named.

Principal Firs :—

Douglas Fir (*see* *Pseudotsuga Douglasii*).
 Scotch Fir (*see* *Pinus sylvestris*).
 Grecian Silver Fir (*see* Silver Fir (*see* *Abies pectinata*).
Abies cephalonica).
 Prince Albert's Fir (*see* *Tsuga mertensiana*).

FISCHERIA.

Tropical evergreen climbers (*ord.* *Asclepiadæ*). They root readily from cuttings, and grow freely in a mixture of equal parts of sandy peat and fibrous loam. Flowering is encouraged by stopping the side shoots when 3' long.

Principal Species :—

acuminata, 12', sum., st., wh.
 martiana, 12', sum., st., wh.
 macrocarpa, 15', sum., st., wh.

FISH MANURE.

Fish in various stages of decomposition applied to land makes an excellent quick-acting manure for most kinds of crops. If only slightly decomposed it should be dug in and allowed to rot previous to any planting being done. If the ground is required for immediate use the fish should first be mixed with soil and put in a heap to rot for a few weeks before being applied. Commercial dry fish manure may be purchased.

FITTONIA.

Ornamental foliated stove plants (*ord.* *Acanthaceæ*). They are natives of Peru and are char-

acterised by short, fleshy, creeping stems and highly coloured evergreen leaves. The flowers are of minor importance. Propagation, by cuttings or division. The soil should be rich, light, and peaty. Heat and atmospheric moisture, with shade from bright sun, and plenty of water while growing, suit them. The colours in the subjoined species apply to the leaves.

Principal Species :—

argyoneura, 6'', grn., wh. veins.
 Verschaffeltii, 8'', grn., red veins.
 gigantea, 1½', grn., red veins.

FLAGELLARIA.

A small genus of evergreen climbing plants (*ord.* *Flagellariæ*). The chief species, *indica*, is propagated by division in spring, grows in fibrous loam and peat, and requires an intermediate temperature.

Principal Species :—

gigantea, 8', Je., wh.
indica, 7', Je., wh.

FLAME FLOWER.

A genus of beautiful late summer and autumn flowering plants, long grown under the name of *Tritoma*, but now referred to *Kniphofia*. The handsome species illustrated on pages 345 and 347, namely *breviflora* and *caulescens*, also the subject of the coloured plate, *longicollis*, will be found described under *Kniphofia*.

FLAVERIA.

Herbaceous perennials (*ord.* *Compositæ*), requiring greenhouse culture. They grow 1½' to 2' high, and produce heads of yellow flowers. Propagation, by seeds, or division in spring. Soil, sandy loam.

Principal Species :—

angustifolia, 1' to 2', sum., yel.
 Contrayerba, 1½', sum., yel.
 longifolia, 2', sum., yel.

FLINDERSIA.

Evergreen trees (*ord.* *Meliaceæ*). Propagation, by seeds or cuttings. Soil, equal parts fibrous peat and loam. The temperature of a warm greenhouse is desirable.

Principal Species :—

australis, 50' to 60', My., wh. (*syn.* *Stevia pedata*).
 bennettiana, 50'.

FLORESTINA.

Hardy herbaceous perennials (*ord.* *Compositæ*). The leaves are covered with white, silky hairs. Propagation, by seeds sown in a cold frame in March, the seedlings being transferred to the garden at the end of April.

Principal Species :—

pedata, 1' to 2', Jy., wh.
 tripteris, 1½', Jy., wh.

FLORISTS' FLOWERS.

It is the especial duty of the florist to improve upon existing varieties of flowers by raising new

Fimbriaria (*see* *Schwannia*).

Fire Pink (*see* *Silene virginica*).

First of May (*see* *Saxifraga granulata*).

Fischera (*of* Sprengel, *see* *Sieberta*).

Fischera (*of* Schwartz, *see* *Leiophyllum*).

Fish Bone Thistle (*see* *Cnicus*).

Fish Poison Tree (*see* *Piscidia*).

Fissilia (*see* *Olaix*).

Fire Fingers (*see* *Syngonium auritum*).

Flame Lily (*see* *Zephyranthes*).

Flamingo Flower (*see* *Anthurium scherzerianum*).

Flat Pea (*see* *Platylodium*).

Flax (*see* *Linum*).

Flax Lily (*see* *Phormium*).

Fleabane (*see* *Oxyza* and *Erigeron*).

Floverkea (*of* Sprengel, *see* *Adenophora*).

Florida Ribbon Fern (*see* *Vittaria lineata*).

ones, as well as by propagating existing varieties. Hence many of the popular races of garden plants, such as Chrysanthemums, Carnations, Auriculas, and Tuberous Begonias, which have been brought into existence by hybridisation, cross fertilisation, and careful selection of the most perfect forms, combined with high-class cultivation, are termed "florists'." To perpetuate florists' varieties, cuttings, layers, offsets, or grafts have to be depended upon. Seedlings, except in a few cases, have a tendency to run wild, even when they are the result of careful artificial pollination. New varieties

botanist regards these as the floral envelopes, merely developed for the service of the flower proper, viz. the organs of reproduction. A perfect flower consists of the calyx (sepals), which is usually green, and forms the outermost series; the corolla (petals), which is the showy portion, is of many colours, developed to attract insects, which shall assist in fertilisation; the stamens, which are the male organs; and the pistil, with the ovary, which constitute the female element. Many flowers, termed by the botanist "Incomplete," are always lacking in one or both of the floral



THE STEMMED FLAME FLOWER, *KNIPHOFIA CAULESCENS* (see FLAME FLOWER and *KNIPHOFIA*).

are, however, raised from seed, and occasionally from "sports," as in the case of the Chrysanthemum. The raising of new varieties from seed is an uncertain operation; not more than 1 per cent. of the seedlings is worth keeping as a rule.

In addition to the subjects that have been already mentioned, Amaryllises (*Hippeastrums*), Roses, Gladioli, Fuchsias, Dahlias, Hyacinths, Polyanthus, Show and Regal Pelargoniums, Phloxes, Zonal Pelargoniums ("Geraniums"), and Tulips, fall into the category of "florists' flowers," and there are many others.

FLOWER.

A collection of modified leaves, including the essential organs of reproduction. The botanists' idea of a flower does not coincide with the popular acceptance of the term. In the latter case the showy parts of the blossom—the calyx and corolla—are looked upon as the flower itself, whereas the

envelopes. Others, although they belong by affinity to Natural Orders of "Complete" flowers, have only one series of floral envelopes. Thus in *Caltha*, the Marsh Marigold; *Eranthis*, the Winter Aconite; and *Clematis*, the corolla is wanting, and the calyx forms the showy part of the flower. In *Helleborus*, the Christmas and Lenten Roses, the same thing occurs, but the petals are represented by a ring of honey glands or nectaries. In *Bougainvillea*, and in the popular *Poinsettia*, the ring of protective "bracts" forms the showy part of the inflorescence, and, in *Bougainvillea* especially, is commonly regarded as the true flower.

The botanist holds that all the component parts of the flower have arisen through the modification of the ordinary foliage leaves. That this is correct frequently receives additional proof by fortuitous examples of flower leaves putting on the distinctive forms and green colouring of foliage leaves, and *vice versa*. Green flowers are not uncommon—the green Rose and the green Chrysanthemum

are well-known examples—but they are really reversions to an ancestral form. There was a time when all flowers were green. The development of colour in the flower is a big and interesting subject. From Nature's standpoint it is simply a means to an end, and the end is fertilisation. Flowers fertilised by insects have conspicuous colouring.

FLOWER GARDEN.

The position chosen for the flower garden should be within easy access of the dwelling house, should have either a south, south-west, or west aspect, and should be sheltered as much as possible from cold north or easterly winds. Good drainage is essential to the successful cultivation of flowers, therefore when this is not accomplished naturally earthenware drains should be laid some 3' to 4' below the surface, and allowed to fall towards a ditch or trap at the lowest part of the garden. The garden should, as a general rule, be fairly level, with a slight slope, if possible, to the sun. Raised banks, where such do not exist naturally, should be added in suitable positions. A goodly proportion of lawn should be allotted to every flower garden, as nothing enhances the floral display so much. Wherever possible, beds should be constructed either around the edges of lawns or cut out on their surface, and if they are somewhat raised above the surrounding level the appearance of their occupants will be improved. An herbaceous border, wherein may be grown a great variety of beautiful hardy perennial plants, supplemented in their season by hardy and half-hardy annuals and biennials, should be formed.

Bedding falls naturally into three groups, viz. spring bedding, when the display is obtained principally from bulbous plants, such as Hyacinths, Tulips, and Narcissi, carpeted with low-growing Arabises, Alyssums, Thymes, and Sedums, together with Polyanthuses, Primroses, Double Daisies, Forget-me-nots, and Wallflowers; summer bedding, when almost all the ordinary occupants of our greenhouses and stoves may be utilised, together with "Geraniums," Fuchsias, Calceolarias, Tobaccos, Lobelias, Carnations, Petunias, Stocks, Asters, and the thousand and one plants then readily obtainable; and finally, the all too little practised winter bedding, when dwarf-growing evergreen shrubs and Conifers, Heaths, Thymes, Sedums, Veronicas, etc., may be freely employed to give the beds a bright appearance during the dullest, dreariest months of the year.

Vases placed on either side of a flight of steps, at ends of walks, or around the dwelling house, will admit of the display of flowers and trailing plants. It should always be remembered, as a golden rule of gardening, that the early removal of decaying flowers, with the consequent prevention of seed formation, tends to prolong the blooming.

FLOWER POTS.

Flower pots are generally sold by what is known as the "cast," which was the old name given to the number of pots evolved from a given quantity of clay, whether that number were 60 to 100, or resolved into a single giant pot termed a No. 1.

The following table shows the numbers of pots to a cast, and also their diameters, depths, and names:—

Top Diameter, inside measurement.	Depth, inside measurement.	No. to Cast.	Name
20 Inches.	18 Inches.	1	Ones.
18 "	14 "	2	Twos.
15 "	13 "	4	Fours.
13 "	12 "	6	Sixes.
12 "	11 "	8	Eights.
11½ "	10 "	12	Twelves.
9½ "	9 "	16	Sixteens.
8½ "	8 "	24	Twenty-fours.
6 "	6 "	32	Thirty-twos.
4½ "	5 "	48	Forty-eights.
3 "	3½ "	60	Sixties.
2½ "	2½ "	80	Thumbs.

A smaller size than the last, called "Thimbles," and an intermediate size between 48's and 32's, called 40's, are also extensively used, the latter being a useful size for plants employed to fill vases in dwelling rooms.

Pots deeper in proportion to their width are made for bulbous plants, such as Liliums, which are better suited by this style of pot. Others are perforated at the sides for growing Orchids and epiphytal plants generally, while double pots are occasionally met with whose mission is to protect tender roots from undue scorching by summer's sun, or freezing by winter's cold.

FLUES.

Prior to the introduction of hot water for heating purposes, flues of brick were generally employed for furnishing the necessary warmth to stoves and greenhouses. A few are still to be met with, even in good gardens, yet they have so generally fallen into disuse as to call for no special mention at the present day.

Where the heat from a kitchen stove is utilised for warming a small glasshouse, it may be conveniently conducted through a pipe of earthenware such as is used for drainage purposes, taking care that the joints are well made.

Flues in an ordinary greenhouse stove or boiler should be regularly cleansed of soot or dust with a wire flue brush and an iron hoe attached to a flexible handle, using pieces of petroleum-soaked paper to burn in the flues for the purpose of testing their cleanliness.

FONTANESIA.

Hardy, bushy shrubs (*ord.* Oleaceæ) with small, sub-evergreen, Privet-like leaves. Propagation, by cuttings of half-ripe shoots inserted in sandy soil in a close case during July and August. Soil, light sandy loam.

Principal Species :—

Fortunei, 6' to 8', Jy., philliræoides, 6' to 8', Jy.,
yel., wh. yel., wh.
—longifolia.

FORCING.

A term applied when artificial means are resorted to for the production of flowers, fruits, or vegetables

Flowering Ash (see *Fraxinus Ornus*).
Flower of the West Wind (see *Zephyranthes*).
Flower of Tigris (see *Tigridia Paromia*).
Flowering Box (see *Vaccinium Vitis Idæa*).
Flowering Currant (see *Ribes sanguineum*).
Flowering Rush (see *Butomus umbellatus*).

Flüggea (see *Ophiopogon*).
Fly (see *Aphides*).
Fly Orchis (see *Ophrys*).
Flywort (see *Myanthus*).
Foam Flower (see *Tiarella cordifolia*).
Fotataxus (see *Torreya*).

out of their proper seasons. Various means are adopted to gain this end, from the humble bucket, packed round with straw, which the cottager places over his Rhubarb, to the large houses specially fitted up with elaborate systems of hot-water pipes. Forcing is also done on a large scale in some places with the aid of fermenting material, and for some things this is found preferable to hot water. For very early forcing, brick pits are advantageous. These pits, if filled with fermenting material, allow of the pots being plunged, and a vigorous, moist heat is provided for the roots. For some things, such as Rhubarb, Lilac, and Lily of the Valley, it is absolutely necessary to keep the houses quite dark; in the first case until the produce is fit to gather, in the other cases until the flowers open. A forcing house should never be allowed to become dry; when syringing cannot be done, paths, stages, etc., must always be kept wet. In all cases it is better to commence forcing in a low temperature and gradually rise to the maximum. It is always advisable to specially prepare plants that are to be forced. Shrubs for spring forcing should always be potted several months previously. Subjects suitable for forcing include most fruits, early vegetables, flowering shrubs, bulbs, Lily of the Valley, etc. Many of these are dealt with separately under their respective heads.

FORERIGHT SHOOTS.

A term applied to shoots on trained trees that are produced from the front of the branches at right angles with the wall. As they cannot be laid in against the wall or other support satisfactorily they should be shortened to form fruiting spurs.

FORGET-ME-NOT.

A name popularly used for various species of *Myosotis*, a genus of *Boraginæ*. The term Antarctic Forget-me-not is used for *Myosotidium nobile*, the flowers of which, though larger, resemble those of the common Forget-me-not. Several Forget-me-nots are included among our British wild plants. The cultivated species are all popular garden plants. The flowers are borne in late spring and early summer, and are blue, white, or pink in colour. All may be grown from seeds sown out of doors on a sunny border in March or April; the perennial ones may also be increased by dividing the roots after flowering. They like a good, loamy soil, but grow in almost any sort. (For list of species, see *MYOSOTIS*.)

FORK.

Digging forks are usually made with four strong steel prongs tapering to a point. Another useful implement is of the same character, but the tines are flat and have rather less space between them. These forks are capital tools for lifting Potatoes. Dung forks are of a lighter make than the above, and have long, thin, steel prongs. They are specially designed for loading and removing farmyard manure and straw litter. Small hand forks are useful little implements in the garden. They have three prongs and are suitable for use in transplanting. The agricultural hay fork, with two curved tines and long handle, has its use in the garden for removing and shaking out long litter used in the make-up of hotbeds.

Forbesia (see *Curculigo*).

Foreign Violet (see *Schweiggeria*).

FORRESTIA.

Tropical, *Tradescantia*-like plants (*ord.* *Commelinaceæ*). They usually have more or less oval-shaped leaves, prominently veined and very hairy. Cuttings root readily if inserted in light soil in an open border. Soil, equal parts of peat and loam, with a good dash of sand.

Principal Species :—

glabrata, 2', sum., red. *Hookeri*, 3', sum., pur.

FORSYTHIA. (GOLDEN BELL.)

Charming shrubs (*ord.* *Oleaceæ*) of deciduous habit, which should be grown in every garden for their pretty flowers in March, April, and May. Propagation, by layers, or by cuttings in summer planted under a hand-light. Any common soil. The *Forsythias* look charming among other deciduous shrubs or trees in spring, and are also good wall plants, especially in the colder districts. They should not be trained too stiffly, but allowed to hang from the wall.

Principal Species and Hybrid :—

intermedia, 8', Ap., yel. *suspensa*, 12', Ap., yel. :
hybrid (*suspensa* × *vars.*, *Fortunei* and
viridissima). *Sieboldii*.
viridissima, 8', Ap., yel.

FOTHERGILLA.

A pretty, deciduous hardy shrub (*ord.* *Hamamelidææ*) with fragrant flowers. It is a good plant for the shrubbery, and may be increased by seeds sown in peaty soil in the border or in pans in spring, or by layers. It likes a sandy peat soil of a moist character.

Principal Species :—

Gardeni, 6', Ap., My., wh. (*syn.* *alnifolia*). *Acuta*, major, obtusa, and *serotina* are vars. of this.

FOUNTAINS.

As a rule, the simpler a fountain is the better it looks in a garden. Arrangements of rocks, with one or more strong waterspouts, are more suitable than ornate stone basins and statues such as are seen in town squares. Simple arrangements in the midst of a pool or lake in which Water Lilies and other aquatics thrive are often very effective. If a formal fountain is desired it should be placed in a formal part of the garden. When arranging for a fountain care should be taken to find out whether a continuous supply of water can be obtained throughout the driest weather, for if a fountain has to stop playing it becomes an eyesore.

FOXGLOVE.

The common Foxglove is *Digitalis purpurea*, a plant which has attached to it some interesting legends and bits of folk-lore, but the name has become applied to all the species of *Digitalis* now in gardens. It is said to be derived from the Anglo-Saxon "*Foex-glof*," from some connection with the Fox, and the resemblance of the flower to the finger of a glove. As a garden plant the Foxglove is of much value, the large-flowered and spotted forms being particularly effective. *D. purpurea* is a biennial, but some of the others are perennial. (See *DIGITALIS*.)

Formica (see *Ant*).

Forrestia (of *Ratnesque*, see *Ceanothus*).

Forsythia (of *Walter*, see *Decumaria*).

Fountain Plant (see *Amaranthus salicifolius*).

Fourcroya (see *Furcraea*).

Foxbane (see *Aconitum Vulparia*).

Foxtail Pine (see *Pinus balfouriana*).

FRAGARIA.

Hardy, evergreen herbs (*ord.* Rosaceæ), mostly cultivated for the sake of their fruit; but *indica* and *chiloënsis* variegata are grown as rockery plants, while *vesca* monophylla and *collina* are planted as curiosities. Propagation, by seeds to obtain new and improved varieties, and in the case

pina). Alpine Strawberry. *virginiana*, 8", My., Je., wh.

Other Species:—

californica, 6", My., Je., wh. (*syn.* *lucida*). *collina*, 6", My., Je. (Green Pine).

FRAMES.

Frames of every conceivable shape and size may



Photo: Cassell & Co., Ltd.

FRAXINUS ORNUS (see p. 351).

of the Alpines, which do not produce runners; in all other cases by runners. Any ordinary garden soil will suit them. (See also STRAWBERRY.)

Principal Species and Varieties:—

<i>chiloënsis</i> , 6" to 12", My., wh.	<i>vesca</i> , 3" to 6", My., Je., wh.
— variegata, variegated.	— monophylla, 3" to 6", wh. (<i>syn.</i> monophylla).
<i>elatior</i> , 6", My., Sep., wh.	— semperflorans (<i>syn.</i> al-
<i>indica</i> , 4", My., Jy., yel.	

be found in gardens, and though certain designs have their special uses, many of them are faulty in various respects. The two-light frame is a very convenient form, because it can readily be moved about and placed on prepared beds of fermenting manure, leaves, brewers' hops, etc., for forcing purposes. The two sashes should each be 6' long by 4' wide, and have the frame of wood 2" thick, neatly dovetailed, one piece into the other, at the corners;

also furnished with an iron handle across the top end, and braced together by a bar of iron across the middle of the lower side to strengthen the fabric. The longitudinal bars carrying the glass should be as thin as possible compatible with strength and durability, so as not to obstruct the light. The wood of the four sides of the frame should be $1\frac{1}{4}$ " to $1\frac{1}{2}$ " thick, fitted closely together to exclude air, and strengthened at the angles inside with upright bars of wood. A wooden bearer to carry the lights should be fitted down the middle of the frame, with a rib of wood along the middle of it to keep the sashes in place. A flange of wood should be nailed along the outside of the two sides for the same purpose, and the sashes should fit in their places exactly. The frame may be 18" deep at the back and 13" to 14" in front, or any other depth in that proportion. This will suffice to carry off rain or melting snow in winter. A three-light frame has simply an additional width for another sash, but it is less convenient for moving about. The depth of frames should never be greater than is sufficient to hold the necessary soil and accommodate the plants, so that the latter may always be close to the glass to prevent their being drawn.

FRANCOA.

Handsome herbaceous perennials (*ord.* Saxifragæ), which are only hardy in warm localities and in sheltered positions, unless covered with a few inches of litter. They may, however, be grown in pots and planted out in summer. The beautiful "Bridal Wreath"—*ramosa*—is charming when planted out in rockwork in large conservatories. The hardest is *sonchifolia*. Propagation, by division of the plants in spring, or by seeds sown in slight heat in spring, and the plants hardened off if for outdoor work. A rather dry, sandy soil suits

Principal Species :—

appendiculata, 2½', Jy., *sonchifolia*, 2½', Jy., pur.
pur. (*syn.* *rupestris*).
ramosa, 2½', Jy., wh.

FRANKENIA. (SEA HEATH.)

Small plants (*ord.* Frankeniaceæ) of little garden value, but interesting to some Alpine growers. They grow in sandy loam and peat, and are increased by division, seeds, or cuttings.

Principal Species :—

ericifolia, 3", Jy., hlf- *intermedia*, *Nothria*,
hdy., red. etc.).
hirsuta, 3", Jy., pale bl., *lavis*, 9", Jy., pk.
red (*syn.* *hispida*, *modiflora*, 3", Je., pk.

FRANSERIA.

Hardy and half-hardy annual or perennial herbs (*ord.* Compositæ). *Artemisiodes*, 5' to 6', July, is the only species of note; it does best when treated as a half-hardy biennial, can be easily raised from seeds, and prefers a light, loamy soil.

FRASERA.

A small genus of North American herbs (*ord.* Gentianæ). A wet position is sometimes prescribed for *carolinensis*, but it grows naturally in dry soil. Propagation, by seeds sown in spring.

Principal Species :—

carolinensis, 3', Je., yel., wh., br. dots.

Franciscea (*see* *Brunfelsia*).

Franciscia (*see* *Darwinia*).

Frankincense (*see* *Pinus Teda*).

FRAXINUS. (ASH.)

Ornamental, hardy, deciduous trees, of much beauty, but to be avoided in small gardens, where their roots rob the soil and the branches overshadow other plants. Propagation, by grafting in the various forms, and by seeds for the species. The seeds are gathered in October, mixed with sand, and laid in a pit or heap until February, when they are sown in beds. The seedlings are transplanted when about two years old to a nursery bed, there to remain till large enough to be planted permanently. Any good soil will do.

Principal Species and Varieties :—

americana, White Ash, 40', Ap., My., wh. (*syn.* *acuminata*, *alba*, *curvidens*, *glauca*, etc.). This has several vars., *latifolia*, *microcarpa*, *aucubæfolia*, and *foliis argenteis* variegatis being the most desirable.
excelsior, Common Ash, 30' to 80', Meh., Ap., yel., grn. There are many vars.; *aucubæfolia*, *amarissima*, *aurea*, *a. pendula*, *cortice variegato*, *crispa*, *foliis argenteis*, *heterophylla*, *h. variegata*, *h. laciniata*, *lutea*, *monstrosa*, *myrtifolia*, *pendula*, *Wentworthii*, *scolopendrifolia*, and *spectabilis* are good.
Ornus, *Manna* or Flowering Ash, 30', My., grn., wh. (*syn.* *paniculata*, *europæa*, etc.). (*See* p. 350.) A fine species, good vars. being *angustifolia*, *latifolia*, and *variegata*.

Other Species, Hybrid, and Varieties :—

angustifolia, My., grh., wh. (*syn.* *rostrata*, *salicifolia*, etc.).
anomala, 5'.
caroliniana, 30', Je. (*syn.* *americana* of Marsh, *nigrescens*, etc.).
chinensis, 5'.
expansa, 30', My., hybrid (*americana* × *viridis*).
nigra, 30', My. (*syn.* *sambucifolia*).
parvifolia, 20', My.; var. *pendula*.
pennsylvanica, 20', My.; vars., *foliis argenteis*, *marginatis*, and *lanceolata*.
quadrangulata, 30', My.

FREESIA.

Description.—Beautiful greenhouse or conservatory bulbous plants (*ord.* Iridææ), which are also of much value for growing in windows. They have beautiful, fragrant flowers, and are of remarkably easy cultivation. In a few gardens, even in the north, they are grown very successfully in cold frames, planted out, and with only a mat over them in severe frosts. The cut flowers last long in water.

Propagation.—By offsets, removed when the plants are at rest, or by seeds, sown under glass as soon as ripe.

Soil.—Two parts of loam, and one part each of leaf soil and well-decayed cow manure.

Other Cultural Points.—The bulbs may be potted in successive batches from August onwards, and plunged until growth begins, when they may be introduced into gentle heat, plentiful supplies of water being given at this time. Failures with *Freesias* frequently occur from the want of water. Air should also be freely given in favourable weather. Old bulbs ought to be shaken out of the soil in August and repotted, the smaller bulbs being planted separately to increase in size. Seedlings may be pricked out into pots or pans when large enough, and grown on in frames where frost is excluded. It cannot be too strongly pointed out that the *Freesia* dislikes a very high temperature when in growth, though it should be roasted in the sun when it has completed growth after flowering.

Principal Species and Varieties :—

Leichtlini, 1', yel., or cream and or. The var. major has larger flowers. *Kew Hand-List* regards this as a var. of refracta.

refracta, 1', My., wh., or., occasionally with vio. lines (*syns.* Gladiolus refractus and Tritonia refracta).

— alba, pure wh. (*see figure*).

— odorata, yel., lvs. broader than type.

xanthospila. This differs little from *F. refracta* alba (*syn.* Gladiolus xanthospilus). *Kew Hand-List* regards this as a var. of refracta.

FREYCINETIA.

Evergreen stove or greenhouse climbers (*ord.* Pandaneæ), grown, like Pandanus, solely for the sake of their foliage. Propagation, by offsets. Sandy loam suits. They are most useful for covering the pillars of glasshouses, and do best when the pillars are covered with fibrous peat.

Principal Species :—

angustifolia, st., grn.
Banksii, grh., grn.

baueriana, grh., grn.
insignis, st., grn.



Photo: Miss L. King-Harman.

FREESIA REFRACTA ALBA.

FREMONTIA.

A hardy or half-hardy shrub (*ord.* Sterculiaceæ), with showy yellow flowers. Propagation, by cuttings in sandy soil under a bell-glass in spring. Sandy loam, with a little peat or leaf soil, suits. In the open air it succeeds best in the more favoured parts of the south and west coasts of Britain.

Only Species :—

californica, 10' to 15', Ap., My., yel.

FRIDERICIA.

A small genus of evergreen, stove, climbing shrubs (*ord.* Bignoniaceæ) scarcely differing from

French Bean (*see Bean*).

French Marigold (*see Marigold*).

French Willow (*see Salix triandra*).

Frenella (*see Callitris*).

Friedrichsthalia (*see Trichodesma*).

Fringe Lily (*see Thysanotus*).

Fringed Violet (*see Thysanotus*).

Bignonia. Propagation, by cuttings of half-matured shoots in summer in sandy loam and peat in a propagating case. Loam and peat in equal parts suit.

Principal Species :—

Guilielma, st., yel.

FRITILLARIA. (SNAKE'S HEAD LILY. GUINEA HEN FLOWER.)

Description.—Singular, and often effective, garden flowers (*ord.* Liliaceæ), of considerable value for borders or rock gardens. The most useful for ordinary garden purposes are the varieties of *Imperialis* (Crown Imperials), which are of stately habit, and make a good display in the borders in May. Many of the others are seen to be of much beauty if they are examined carefully, the inside of the segments being usually more beautiful than the outside. A number are prettily chequered in the same way as the common Snake's Head Lily, *Meleagris*. There are so many species that some must be omitted from the annexed list.

Propagation.—By offsets, removed when the bulbs are at rest, or by seeds sown in pans in a frame when ripe or in spring. Many good varieties may be raised in this manner.

Soil.—Rich and well drained for the greater number of the species, but *Meleagris* naturally grows in wet meadows, although it can be cultivated in a dry soil.

Other Cultural Points.—The Crown Imperials (*Imperialis*) like good treatment, and are all the better for a top-dressing of manure in winter. The other species do best in the rock garden, but should be protected from slugs, which are very fond of some species.

Principal Species and Varieties :—

armena, 6", Ap., pur. A pretty little plant, of which there are red and greenish yel. vars.

aurea, 8", My., yel.

Imperialis, 4", Ap., My., yel. The favourite Crown Imperial. There are several vars., including *aurea* - *marginata*, lvs. margined yel.; *argentea* - *marginata*, lvs. margined wh.; *Aurora*, red; *lutea*, bright yel.; *Crown-upon-Crown*, having two tiers of flowers; *rubra*, dark red; *Slagward*, with sword-like stems caused by

fasciation; *Sulphurine*, sulphur yel., etc.

lutea, 9", My., yel.

Meleagris, 1", Ap., pur.

The common Snake's Head Lily (*see figure*). There are named vars., including some with wh. and double flowers. The broad-leaved vars. are handsome. All are prettily chequered.

pallidiflora, 9", Ap., pale yel.

pudica, 6", My., yel.

pyrenaica, 1½", Je., pur. (*syn.* *nigra*).

recurva, 6" to 18", My., sc., yel. One of the most beautiful, but rather difficult to establish.

lanceolata, 1½", My., pur.

latifolia, 1", My., red.

— *kotschyana*.

liliacea, 9", My., wh.

lusitanica, 1", My., br., pur.

macrophylla (now *Lilium*

roseum).

meleagroides, 1", My.,

pur. (*syn.* *minor*).

messanensis, 1", My., pur.,

br.

Moggridgei (*see tubæ-*

formis).

oxypetala of Hooker is

Stracheyi.

— (*Royle*), 1½", Je., pur.

(*syn.* *Lilium oxypetalum*).

persica, 2", My., vio., br.

— *minor*.

pontica, 6", My., br., grn.

ruthenica, 1", My., pur.

Sewerzowii, 1½", pur.,

grn., yel.

— *bicolor*, olive grn., br.

sieheana, 1½", My., red,

grn.

Stracheyi, 9", My., pur.

(*syn.* *oxypetala* of Hooker).

tenella, 1", My., pur.

tubæformis, 9", Je., pur.,

yel. (*syn.* *delphinensis*).

Vars. *Burneti*, br., wh.

(*syn.* *F. Burneti*); *Mog-*

gridgei, yel., br. (*syn.*

F. Moggridgei).

tulipifolia, 1", My., pur., br.

Walujewi, 1", My., leaden

br., wh.

Whittalli, 1", Ap., pur., br.



FRITILLARIA MELEAGRIS.

FRÆLICHIA.

Annual or perennial stove herbs (*ord.* Amarantaceæ). Propagation, by seeds in heat during the early part of the year. Soil, loam, leaf mould, and sand.

Principal Species :—

floridana, 6" to 36".

FROG-HOPPER.

A four-winged insect (*ord.* Homoptera) allied to the Aphides and Jumping Plant Lice, but belonging to a different section. It is *Aphrophora spumaria*, known under various other names, including such popular ones as Cuckoo Spit Fly and Froth Fly. The insect in all stages lives upon *Chrysanthemums*, *Carnations*, and other garden plants, which it punctures, and of which it sucks the juice with its proboscis. The larvæ may be destroyed by

Fritillary (*see Fritillaria*).

Fritaldia (*see Microglossa*).

Other Species :—

aemopetala, 1½", Ap.,

pur., grn.

Bœnmülleri, 9", My.,

yel.

canaliculata, 1½", Mch.,

pur.

citrina, 9", Ap., My., grn.

dasyphylla, 6", Ap., pur.,

yel.

delphinensis (*see tubæ-*

formis).

Ehrhartii, 6", My., pur.,

yel. (*syn.* *macrandra*).

Hookeri (now *Lilium*

Hookeri).

sweeping away the froth with a light broom; also by syringing with strong soap-suds. Valuable plants may be cleared by hand-picking.

FROST.

When the temperature sinks to 32° F. (the freezing point of water), or below that, it is said to be freezing. Many plants are unable to resist a temperature at freezing point for any length of time, and are said to be tender. Others can resist a varying degree of frost according to their kind, and are said to be hardy in certain latitudes and at certain altitudes. Those that are injured or killed by frost suffer from the rupturing of their tissues by the expansion of the same. The gardener can counteract the influence of this to a considerable extent, by getting up before sunrise and syringing the affected plants with water a few degrees above freezing point; they then get gradually thawed before the sun strikes them while in the frozen condition. Plants should not be wetted overnight intentionally, as that renders them more liable to injury than if dry. The same holds good with regard to plants under glass, particularly in unheated structures. The seeds of Hollies, Hawthorn, Roses, etc., germinate more freely after having been frozen; and Lily of the Valley crowns force more readily after having been subjected to frost or retarded in a refrigerator. Freezing acts beneficially upon soils by disintegrating and pulverising them, thereby releasing plant food or rendering it soluble.

FRUIT.

Included under the general title "fruit" are kinds requiring glass structures and artificial heat to bring them to perfection, as well as others cultivated in the open air. Full particulars of the treatment required by all fruits grown in gardens are given under their respective names.

The Arrangement of Fruit Gardens.—In most private establishments the object is to obtain variety, with economy in space. With this end in view, hardy fruits are largely grown in kitchen gardens, where the arrangement must be attended with judgment. Bush and pyramid trees of Apples, Pears, Plums, and Cherries are planted in borders running parallel with the walks, espaliers also being suitable for such positions. Stocks of a dwarfing character should be employed, and due attention paid to the principles of pruning. Bush fruits, such as Currants and Gooseberries, are best provided with a quarter to themselves, as the fruit can be more readily protected from birds. Raspberries may be grown in clumps or in rows, with the canes supported by a wire trellis. Adequate room should be reserved for Strawberry beds, and advantage taken of all wall space. Well trained trees of the best varieties should be selected for growing on walls. In addition to garden fruit, a well arranged orchard, in which standard trees are grown, is a useful adjunct to an establishment.

Successions of Fruits.—Even with fruits possessing no keeping properties there are early, succession, and late varieties, and when planting this fact should be borne in mind, in order that the season of production may be as long as possible.

Frog Orchis (see *Habenaria viridis*).

Froloria (see *Saussurea*).

Frost Grape (see *Vitis cordifolia*).

In the case of fruits amenable to storage, such as Apples and Pears, the question is one of great importance, as by careful selection good fruit may be had nearly all the year round. Selections of varieties of Apples and Pears for early and late use are given under their respective headings.

Storing.—In the absence of better facilities, late keeping Apples and Pears may be successfully stored in dry cellars and spare rooms, where an average temperature of from 40° to 45° can be maintained. A properly erected fruit room is preferable, and an easterly or north-easterly site is



Photo: Cassell & Company, Ltd.

FUCHSIA SUPERBA (syn. TRIPHYLLA SUPERBA,
see p. 355).

the best to select for it. The structure may either be a lean-to or a span roof, according to position. Fourteen-inch walls are the best, and these should be hollow above the ground line. Means of ventilation should be provided at the ridge, and in case of need it is advisable to have a hot-water pipe, or other means of heating, in the house. Tiers of shelves, the latter being formed of broad laths, should be arranged round the sides for the accommodation of the fruit. A simpler span-roofed structure may be built of wood, with the sides and roof thatched with straw. The fruit should be placed carefully on the shelves in single layers, and each variety labelled.

FUCHSIA.

Description.—Deciduous flowering plants (ord. Onagraceae). The species, which vary in character and mostly come from South America, are worthy of more general culture. A few are quite hardy others nearly so, and they may be seen growing

freely near the sea coast, where they form beautiful objects in gardens.

Propagation.—By seeds and cuttings. The former method is usually employed for raising new varieties, and seeds are sown in the spring. Cuttings are best struck in spring. When plants that have rested through the winter show signs of movement in February, a little heat will stimulate them into growth. In March, when the young shoots are about 2" long, they should be taken off close to the old wood, and, after the removal of

side shoots, where necessary, to ensure a pyramidal form. Fine specimens are obtained by striking cuttings in September, growing the plants gently through the winter, and potting early in the spring. They should be carefully grown in pots, hardened, and planted in fairly rich soil.

Open-air Culture.—The hardy and semi-hardy forms, such as *coccinea*, *macrostemma gracilis*, and *m. Riccartonii*, are adapted for border culture, and succeed well if planted in good, dry soil. When frost cuts down the stems



Photo: Cassell & Company, Ltd.

FUCHSIA DANIEL LAMBERT IN A BASKET (see p. 356).

the lower leaves, inserted in pots or pans, a gentle watering given to settle the soil, and placed over a mild hotbed, or in a propagating house. Shade from hot sunshine, and transfer to small pots when they are rooted.

Soil.—For cuttings and small plants use equal parts of fibrous loam and leaf mould, with sufficient sand to keep it open. For later pottings employ a compost formed of three parts of loam, one part of leaf mould, one part of well-decomposed manure, a sprinkling of wood ashes, and sand enough to keep the whole porous.

Treatment of Pot Plants.—When the cuttings are rooted remove them to 4" pots, and grow the plants in a temperature of from 60° to 65°, on a shelf close to the glass. Good specimens may be obtained the first season by allowing the leading shoots to grow unstopped, supporting them with neat stakes, and pinching out the points of strong

they should be removed, and the roots protected by covering them with ashes or litter. Outdoor Fuchsias are readily propagated from cuttings in the summer and autumn.

Principal Species, Varieties, and Hybrid:—

- | | |
|-------------------------------------|--------------------------------------------------------|
| <i>coccinea</i> , 2', hdy., crim. | — <i>Riccartonii</i> , hdy., sc. |
| <i>corymbiflora</i> , 6', Aug., sc. | <i>procumbens</i> , yel. grn., red berries. Pretty for |
| — <i>alba</i> , wh. | rockeries and hanging |
| <i>fulgens</i> , 4', Jy., sc. | baskets. |
| <i>macrostemma</i> , 3', Jy., | <i>splendens</i> , 6', Aug., sc., |
| sc., pur. | grn. |
| — <i>corallina</i> , 20', crim., | <i>superba</i> , hybrid (<i>triphylla</i> |
| pur.; good for walls | × <i>corymbiflora</i> , see p. |
| and pillars. | 354). |
| — <i>gracilis</i> , 8', Aug., hdy., | <i>triphylla</i> , Sep., or., sc. |
| sc., pur. | |

Other Species and Hybrid:—

- | | |
|-------------------------------------|------------------------------------|
| <i>alpestris</i> , 20', Aug., crim. | <i>exoniensis</i> , sc., pur.; |
| <i>boliviana</i> , crim. | garden hybrid. |
| | <i>simplicicaulis</i> , Jy., crim. |

A Selection of Varieties :—*With Double Corollas :—*

Avalanche.	Madame Jules Chrétien.
Ballet Girl.	Thalia.
Champion of the World.	Miss Lucy Finnis.
Col. Domino.	Phenomenal.
Duchess of Edinburgh.	Phenomenal (wh.).
Edmond About.	Triumphans.

With Single Corollas :—

Beauty of Trowbridge.	Flocon de Neige.
Charming.	Gertrude Pearson.
Countess of Aberdeen.	Loveliness.
Daniel Lambert (see p. 355).	Lye's Excelsior.
Earl of Beaconsfield.	Mignonne.
Elizabeth Marshall.	Rose of Castile.
	Walter Long.

For Pillars :—

General Grenfell.	Mrs. Todman.
Miss Berrage.	

FUEL.

Fuel is a considerable item of expense in the up-keep of a gardening establishment, so that the most economical fuels, and the most economical methods of employing the same, should be a special object of consideration for every practical gardener, amateur or professional. It is not always economical to use the cheapest coal if it is deficient in heating power, though those living near the coal pits can get breeze, or the dross of coal, at a very cheap rate, and also save a great deal on the cartage. Coke, obtainable at the gas-works, makes a cheap and serviceable fuel, and this may be obtained in any town or village where gas is made. At a distance from the mines it is often advisable to get good coal by virtue of its relatively large heating powers. Within recent years much anthracite coal has been used for heating glass structures, and proves a clean, hard, and very durable fuel, in fact one of the best when properly managed by the stokers. If the fire bars are kept clean the less stoking it gets the better. It contains 80 to 94 per cent. of carbon, and burns with a feeble flame, but gives off great heat. In some districts a good deal of wood is used for fuel, and it has the advantage of getting up heat quickly, but it is not durable for banking up the fires at night. The fuel used should not be saturated, as much heat is wasted in drying up excessive moisture while it is burning. (See also HEATING.)

FUGOSIA.

A small genus of evergreen stove shrubs (*ord.* Malvaceæ). Propagation, by cuttings of short side shoots in spring, in sandy soil, with gentle bottom heat, and covered with a frame or bell-glass. Loam, with a little peat or leaf mould, and sufficient sand to render it porous, suits.

Principal Species :—

cuneiformis, 4', Aug., wh.,	lil., red (<i>syn.</i> Hibiscus multifidus).
pur.	
hakeaefolia, 5', Aug., grh.,	heterophylla, Aug., yel., red.

FUMARIA. (FUMITORY.)

Rather pleasing annuals (*ord.* Fumariaceæ) which will usually sow themselves after the first

Fuchsia (of Schwartz, see *Schradera*).

Fuchsia, Californian (see *Zauschneria*).

Fuchsia-flowered Gooseberry (see *Ribes speciosum*).

Fulchironia (see *Pharix*).

Fuller's Teasel (see *Dipsacus Fullonum*).

Fumana (see *Helianthemum*).

season. They resemble the Corydalises, and the seeds should be sown in March or April. (For perennial *Fumarias*, see *CORYDALIS*, the garden name.)

Principal Species :—

capreolata, 4', Jy., pk.	officinalis, 4', Ap., My., pk. (<i>syn.</i> Burchellii).
media, 3', Jy., pk.	parviflora, 1½', Aug., wh. (<i>syn.</i> leucantha).

FUMIGATING.

Tobacco, in some form or other, is largely used for fumigating. Tobacco paper, tobacco rag, or the real article itself in various forms is utilised. The method is to get some red hot cinders, or a piece of iron or brick made red hot, placing the same in an old pail or flower pot. Cover this with the tobacco in quantity sufficient to fill the house with smoke. Choose a still evening just before leaving off work, close the house, making it as air-tight as possible, and set the apparatus going so that the tobacco will just smoulder and smoke, but not flare up. Leave the house closed till next morning. The plants should not be syringed for twenty-four hours. More recently, Lethorion vapour cones have been invented for fumigating, the number of cones requisite being dependent upon the cubic contents of the house. XL All is another and a very effective and popular fumigating invention, the insecticide in this, as in the previous case, consisting of nicotine in a liquid form, which has to be vaporised by means of a spirit lamp or a piece of candle. Painting the hot-water pipes with a mixture of sulphur and water is an effective means of destroying red spider. It is dangerous to paint flues with it, as the fumes of sulphur are destructive to plant life.

FUNGI.

The essential features of a fungus are that it is a plant devoid of chlorophyll, or leaf green, and derives the whole of its carbonaceous and nitrogenous food from a dead or live host plant. Mushrooms and many toadstools are familiar examples of fungi that live on dead and decaying vegetable matter; these are termed saprophytes. The Potato disease, mildews, rusts, smuts, and Peach blister are but too familiar examples of fungi deriving sustenance from living host plants; these are termed parasites. The most important fungi are dealt with under their own names, or under the names of the plants they attack.

FUNGICIDE.

A preparation employed in the destruction of fungi, specially those which are parasitic upon cultivated plants. Fungoid diseases have been increasingly common of late years, and the necessity for the use of various preparations which, while arresting their development, shall do no serious harm to the host plants has become proportionately greater.

Of many of the specifics in use sulphate of copper forms the principal ingredient. In Bordeaux Mixture (*which see*) it is used in conjunction with quicklime. In other preparations the powder form is favoured. For a winter dressing for fruit trees 1 lb. of sulphate of copper may be mixed in 25 gallons of water, but constant stirring is necessary while application is going on.

Flowers of sulphur is a well-known remedy for

Fumitory (see *Corydalis* and *Fumaria*).

Funeral Cypress (see *Cupressus funebris*).

mildew ; and it is not only reliable, but easy to apply by means of one of the small bellows, such as the Malbec, which the sundriesman has given us.

Condy's Fluid, although not commonly used, is a safe remedy ; it should be applied when of a light rose pink colour ; not stronger.

Ammoniacal solution of carbonate of copper is another excellent specific for scab and mildew. The proportions are carbonate of copper 4 oz., ammonia water (strong) $\frac{1}{2}$ gallon, water 45 gallons. At this strength it is safe and efficacious.

Potassium sulphide, or liver of sulphur, is excellent if applied at the rate of 1 oz. to 3 gallons of water. Use hot water to dissolve the sulphide, and apply lukewarm. Potassium sulphate is of no value as a fungicide.

It should be remembered that in all cases these fungicides can do nothing more than check the growth of the spores with which they come in contact, thus preventing the spread of the disease. They cannot penetrate the leaf tissues and kill the

should have a sunny place to induce it to flower. In cold districts cover slightly in winter. The best for pots are sieboldiana major, subcordata grandiflora, and the forms of lancifolia. Pot in autumn and plunge in a frame until spring.

Principal Species and Varieties :—

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Fortunei, 1½', Jy., lil. ;
very handsome. | several vars. that
named aureo-variegata
(see figure) being pretty. |
| — foliis variegatis, lvs.
marbled wh. on bl.
ground. | sieboldiana, 1', Je., lil. ;
large lvs. exceedingly
handsome ; the vars |
| glaucæ, 1' lil. | cordifolia, major, and
marmorata are all
worth growing (syns. |
| — variegata, yel., grn. lvs. | sinensis, viridis, etc.). |
| lancifolia, 9", Aug., wh.
or lil. There are several
pretty forms of this
and its variety undulata
(syn. F. undulata) ;
albo-marginata, argen-
tea, and aurea are all
good. | subcordata, 1½', Aug.,
wh. ; the form grandiflora
(syn. F. grandiflora), especially desir-
able (syns. japonica
and Hemerocallis alba). |
| ovata, 1½', My., lil. ; | |



Photo : C. B. Dick.

FUNKIA OVATA AUREO-Variegata, near water.

mycelium, or vegetative part of the fungus, which is there growing. Nothing can reach it unless the plant be destroyed with it.

FUNKIA. (PLANTAIN LILY.)

Elegant hardy herbaceous plants (ord. Liliaceæ) of much value in the garden or for growing in pots. The leaves are very pretty, and many produce a fine effect by the sides of ponds. Propagation, by division in spring. Light, sandy soil suits. A good supply of water is necessary while in growth. The foliage of the Funkia grows to a great size in half-shady places, but subcordata grandiflora

Fusarium Lycopersici (see Tomatoes — Sleepy Disease).

Fussia (see Aïra).

Fustic Tree (see *Chlorophora tinctoria*).

FURCRÆA.

A genus of sub-succulent, greenhouse, or stove plants (ord. Amaryllidæ), valued chiefly for the ornamental character of their leaves. Propagation, by seeds or suckers. Soil, loam, leaf mould, and sand, with potsherds or soft red bricks broken rather finely.

Principal Species and Varieties :—

- | | |
|---------------------------------------|-------------------------------------------------------------|
| Bedinghausii, 6', grh.,
grn. | gigantea, 20' to 40', Nov.,
st., grn., wh. |
| cubensis, 6', Nov., st.,
wh., grn. | — variegata, variegated,
longeva, 40', My., grh.,
wh. |
| — inermis, st. ; spineless. | tuberosa, 6', st., pale yel. |
| — Lindeni, st. | Wrightii, 10', sum., grn.,
wh. |
| elegans, 20', win., grh.,
grn. | |

Other Species :—

Commelyni, 25', st.
depauperata, 6', st.
flavo-iridis, 14', grh.,
greenish.
geminispina, 4', st.

macrophylla, st., grn.
pubescens, st., grn.
Selloa, 20', grh., wh.
stricta, 8' to 9', st.
undulata, 10', grh., grn.

FURZE.

The Furze, Whin, or Gorse constitutes the glory of our commons, and greatly excited the admiration of Linnæus, who had never seen it before, when on a visit to this country. It is often used for the purpose of making hedges. The common or European Furze (*Ulex europæus*) and the Dwarf Furze (*U. nanus*), both British, are admirably adapted for the decoration of the wild garden, in beds, clumps, or masses, or for covering dry, sandy, or gravelly banks. The Double Furze (*U. europæus flore pleno*) is the most ornamental of all, and a bank or mass of it covered with a profusion of glowing orange yellow blossom during April, May, and June cannot be over-rated for decorative effect in gardens or pleasure grounds. (See also *ULEX*.)

FUSARIUM.

A genus of parasitic fungi injurious to Rye in the southern counties of England, and to the White Mulberry. In cases of slight attack a fungicide consisting of sulphide of potassium may be used at the rate of $\frac{1}{2}$ oz. to 1 gallon of water, applying it to the plants at intervals of ten days or a fortnight by means of the syringe. Plants that are hopelessly attacked should be at once destroyed to prevent the spread of the disease. One species of *Fusarium* is troublesome to Tomato Growers. (See *TOMATOES*.)

GÆRTNERA.

Handsome shrubs and small trees (*ord.* Loganiacæ) requiring a stove temperature. Propagation, by cuttings of the tips of matured side shoots inserted in spring in sand, in bottom heat. Soil, equal parts of loam and peat, with sharp sand.

Principal Species :—

obtusifolia, 20', Mch., wh., yel. The flowers are fragrant.
racemosa, 18' to 20', Ap., wh., yel.; fragrant. Close to obtusifolia, but the flowers are larger.

GAGEA. (YELLOW STAR OF BETHLEHEM.)

Neat little bulbous plants (*ord.* Liliacæ), which are rarely grown in gardens. They generally like a rather light soil, but fascicularis, a native species, grows more strongly in a moist spot. Propagation, by offsets when at rest, or by seeds sown when ripe.

Principal Species :—

bracteolaris, 6'', Ap., yel. (syn. stenopetala).
Liotardii, 6'', Mch., yel. (syn. intermedia).
fascicularis, 6'' to 12'', stellaris, 6'', My., yel.
Ap., yel. (syn. lutea).

GAILLARDIA.

Showy and useful annual or perennial herbaceous plants (*ord.* Compositæ), of much value for borders, and useful for cutting. Propagation, the perennials by division or cuttings; the annuals by seeds sown under glass in March or April, the plants being hardened off and planted out at the end of May, or seed may be sown in the open in May. A light, but rich, dry soil is best. In many districts the perennial species are scarcely hardy enough to stand the winter, and they should be propagated by cuttings, which may be kept in a

Gabertia (see Grammatophyllum).

frame. The annuals of the best types should be kept in a similar way.

Principal Species and Varieties :—

Amblyodon, 2½', Sep., lanceolata, 2', Je., ann., ann., red. yel. or red.
aristata, 1½', Aug., per., pulchella, 2½', aut., red, yel. This has given a number of handsome vars., sometimes called hybrid Gaillardias. Grandiflora and maxima are good, but many named vars. are to be had from nurserymen. There are a number of vars., of which picta may be named. The form picta lorenziana is curious and pretty, with its tubular florets; it is good for cutting.

GALACTITES.

Hardy annual or biennial herbs (*ord.* Compositæ), allied to the genus *Cnicus*. The plants may be easily raised from seed sown in the open border in March and April. The seedlings should subsequently be thinned to 1' apart each way. Ordinary garden soil.

Principal Species :—

tomentosa, 1½', Jy., pur.; noteworthy for its milky juice.

GALANTHUS. (SNOWDROP.)

Description.—Universal favourites (*ord.* Amaryllideæ), too well known to need any commendation, of value in garden, meadow, woodland, and pots.

Propagation.—By offsets, removed when the plants are at rest, immediately after the leaves have withered; or by seeds, sown when ripe, or in spring.

Soil.—The Snowdrop is not particular as to soil, but it prefers one of a loamy character which is not very dry during the growing season. The taller forms, and those with broad leaves, like a stronger soil.

Other Cultural Points.—More use should be made of the Snowdrop in the wilder portions of the pleasure grounds, where the grass is not cut before the leaves of the plants become yellow. In planting in turf they should not be placed in formal lines, but in irregular masses and groups. Snowdrops in pots must not be quickly forced, and do best if grown in a low temperature. The Snowdrop disease is sometimes troublesome, and affected plants should be burned.

Principal Species and Varieties :—

Elwesii, 9'', Jan., Feb., wh.; handsome, very variable in size (see p. 359). Good vars. are Whittallii, unguiculatus, and robustus.
nivalis, 6'', Jan., Feb., wh. The common Snowdrop, of which there are many vars. Imperati, the south European form, is a very fine plant, and its form Atkinsii is one of the best Snowdrops we have. Coreyrensis and octobrensis bloom in aut. or early win. Flavescens and lutescens have yel. instead of grn. markings. Melvillei is very fine, and seems close to Imperati. Scharlokii has divided spathes, and grn. marks outside; and virescens has greenish blooms. A number of other vars. are only of interest to specialists.
plicatus, 1', Jan., Feb., wh. The Crimean Snowdrop; a handsome plant with recurved leaves. It is apt to die off without apparent cause.

Galactodendron (see Brosimum).

Galanga (see Alpinia).

Galangale (see Kœmpferia Galanga).

Galapce Tree (see Sciadophyllum Brownii).

Galardin (see Gaillardia).

Galatella (see Aster).

Other Species :—

Allenii, 9", Feb., wh.	latifolius, 6", Feb., wh.
Fosteri, 6", Feb., wh.	nivalis caucasicus, 9", Feb., wh.
græcus, 6", Feb., wh.	Olge, 6", Nov., wh.
Ikariae, 9", Feb., wh.	

A number of hybrid forms are in existence.

GALAX.

A pretty, hardy herbaceous perennial (*ord.* Diapensiaceæ), that flourishes in the rockery. Propagation, by division of the roots in autumn, after growth has ceased. Soil, three parts of leaf mould and one part of loam, with a sixth of rough road sand, and a few nodules of charcoal.

Only Species :—

aphylla, 3" to 6", Jy., wh. (*syn.* Blandfordia cordata).

GALAXIA.

Greenhouse bulbous plants (*ord.* Iridæ) of considerable beauty; natives of the Cape. Propagation, by offsets. Soil, sandy peat and loam in equal parts, with sand. Although the plants do best in the greenhouse they are nearly hardy, and in the south may be grown outdoors if given a sheltered spot and a little protection in winter. The plants are almost stemless.

Only Species :—

graminea, Jy., yel. ovata, My., Sep., yel.

GALEANDRA.

Terrestrial Orchids (*ord.* Orchidaceæ), with long, slender, fleshy stems, referred by some botanists to Eulophia. Propagation, by division. Soil, fibrous peat, with a little sharp sand and a surfacing of sphagnum. Give plenty of water in the growing season, little or none in winter.

Principal Species :—

Baueri, 6", Je., Aug., st., yel.; rare, and difficult to grow.	devoniiana, 1½', Je., pur., wh.
	nivalis, 1½', Mch., olive wh., vio.

GALEGA. (GOAT'S RUE.)

Useful herbaceous perennials (*ord.* Leguminosæ), valued for their beauty and hardiness, and for the usefulness of their flowers when cut. Propagation, by division in spring or autumn, or by seeds sown in a border or frame in spring. Any good garden soil.

Principal Species and Varieties :—

officinalis, 4', Je., lil. The var. alba is pretty, and there is a dwarf form called compacta, 3', lil.;	with a wh. var. Snow-ball, 3'. orientalis, 3½', Je., bl.; creeping roots.
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GALEOPSIS.

Hardy, annual herbs (*ord.* Labiatæ), of no great pretensions to beauty. Propagation, by seeds sown when ripe in the open border. Any ordinary garden soil.

Principal Species :—

Ladanum, 8" to 12", sum., aut., ro. British.	versicolor, 9", sum., aut., yel., spotted pur.
Tetrahit, 1' to 2', pur. or wh. British.	British.

GALIUM. (BEDSTRAW.)

An extensive genus of annual and perennial plants (*ord.* Rubiaceæ), of which very few are

Gale, Sweet (see *Myrica Gale*).
Galedupa (see *Pongamia*).
Galingale (see *Cyperus longus*).
Galinogrea (see *Tridax*).

worth growing in the garden, and these are only suitable for rough rockwork. Verum, the Lady's Bedstraw, is sometimes used for curdling milk. Propagation, the perennials by division, or by seeds sown in spring, the annuals from seeds sown at the same season in the border. Common soil.

Principal Species :—

boreale, 1', Je., Jy., per., wh.	parisiense, 1', Je., ann., wh.
Cruciata, 1', My., Je., per., yel. (<i>syn.</i> cruciatum).	purpureum, 1', Jy., per., pur.
græcum, 6", Jy., per., pur.	rubrum, 1', Jy., per., pur.
Mollugo, 1½', Jy., per., wh.	tricornue, 1', Jy., ann., wh.
	triflorum, 1', Jy., ann., wh. (<i>syn.</i> suaveolens).
	verum, 1', Jy., Aug., per., yel.



Photo: C. R. Bick.

GALANTHUS ELWESII (*ser.* p. 358).

GALLS.

Peculiar growths of various forms produced upon plants of many kinds. They are usually caused by the punctures of insects for the purpose of egg deposition. The eggs hatch into larvæ, which commence at once to feed, and the irritation thus set up in the tissues of the plant brings about the excrescence known as the gall. The common Oak Apple, for instance, is caused by a gall fly known as *Andricus terminalis*. *Cynips aptera*, another fly, is the cause of the galls on the roots of Oak, Elm, Beech, and other forest trees. The Rose Bedeguar (see also *ROSES*) is the work of *Cynips Rosæ*.

GALPHIMIA.

Stove evergreen shrubs (*ord.* Malpighiaceæ), with showy flowers; easy to grow. Propagation, by cuttings of the ripened shoots in a close propagating frame, in spring. Soil, peat and loam, with grit. Firm potting is essential.

Principal Species :—

glaudulosa, 3' to 4', Ap., yel. (<i>syn.</i> humboldt- iana).	glaucia, 6', sum., yel.; the best. hirsuta, 6', Sep., yel.
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GALTONIA. (CAPE HYACINTH.)

Description.—A genus of three species (*ord.* Liliaceæ) of noble bulbous plants, which are of great decorative value in the garden. The commonest species—*candicans*, often known as *Hyacinthus candicans*—is the finest, and its long spikes of drooping white bells are very effective. Mixed with *Gladiolus brencleyensis*, it makes a capital effect in a bed or long border.

Propagation.—By offsets when the bulbs are resting, or by seeds sown under glass. The seedlings take some time to reach a flowering size.

Soil.—A rich, well-manured loam will give the best results.

Other Cultural Points.—In some gardens the *Galtonia* is not hardy if left in the open ground without any covering. In these places it may either be covered 3" deep with dry litter or ashes, or lifted when the leaves become yellow, and stored in a cool place until spring. Plant early in March, 6" deep.

Only Species :—

<i>candicans</i> , 4', Jy., wh. (<i>see figure</i>).	<i>clavatus</i> , 4', Jy., wh. <i>princeps</i> , 4', Jy., wh.
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GAMOLEPIS.

A small genus of greenhouse and half-hardy shrubs and herbs (*ord.* Compositæ) closely allied to *Euryops*. The perennials may be easily propagated from cuttings of the young growths in spring; the annuals by seeds. Soil, loam two parts, leaf soil one part, with sand.

Principal Species :—

annua, 3' to 10', sum., hlf-hdy. ann., yel., or (<i>syn.</i> <i>Tagetes</i>).	<i>euriopoides</i> , 2', grh. shr., yel. <i>Tagetes</i> (<i>see annua</i>).
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GARCINIA.

Evergreen tropical trees (*ord.* Guttiferæ), with edible fruits of delicious flavour. *Mangostana*, the Mangosteen, bears fruit which is said to combine the flavours of our best Grapes, Pineapples, and Peaches. The fruit is round, and about the size and colour of an Orange. It has fruited at Kew, and at Syon House. Propagation, by cuttings of tips of the ripened shoots in strong heat in spring. Soil, two-thirds of loam, one-third of leaf soil, and sand.

Principal Species :—

Cambogia, 40', Nov., yel.	Morella, 30' to 50', yel.:
Mangostana, 20', red.	yields the gamboge of
The Mangosteen.	commerce.

Other Species :—

cornea, 20', Jan., Feb., yel.	Cowa, 60', Feb., yel.
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GARDEN.

A plot of cultivated ground, cropped with flowers, fruits, or vegetables. The care of the

Galvania (*see Palicourea*).

Gamma Moth (*see Moths*).

Gamochlamys (*see Spathantheum*).

Gamoplexis (*see Gastrodia*).

Gangrene (*see Canker*).

Gannymedes (*see Narcissus*).

garden is such a wide and comprehensive subject that it has been split up into a number of heads. Special hints will be found under **FLOWER GARDEN**, **FRUIT GARDEN**, and **KITCHEN GARDEN**, and special subjects such as "manures" and "soils" are treated severally, as well as important operations such as "pruning," "planting," "potting," and "watering." (For rock garden, *see* **ROCKERY** and **ALPINE PLANTS**; and for herbaceous garden, *see* **HERBACEOUS**.)

GARDENER (see LAW).

GALTONIA CANDICANS.

GARDENIA.

Description.—A large genus (*ord.* Rubiaceæ) of stove and greenhouse shrubs, chiefly represented in gardens by the double forms of floridia, which are in great request as cut flowers.

Propagation.—By cuttings of the tips of the shoots taken early in January, and rooted in a close propagating frame in a bottom heat of about 75°. Sandy soil should be employed.

Soil.—When the cuttings are rooted, a compost of equal parts of peat and loam, with sand, may be given for the first potting. For the final potting, two parts of loam, one part of peat, and one part of old Mushroom bed manure rubbed through a sieve, a sixth part of the whole of sharp sand, and a few pieces of charcoal, may be given.

Other Cultural Points.—Gardenias do best when raised annually from cuttings and flowered in 5" and 6" pots. Such plants produce more flower, in proportion to the space they occupy, than others

Gardener's Garter (*see Phalaris*).

which are grown on for several years. Firm potting is essential to induce short, sturdy growth, and thus keep the plants within bounds. Water must be freely given at all times. Gardenias revel in heat, and moisture, and liquid manure when they are plumping up their buds in the autumn. The syringe must be used morning and afternoon, as only in this way can insect pests be kept down. Even then Gardenias are dirty subjects, and a sharp look-out must be kept for mealy bug and scale, which must be dealt with by sponging and brushing with petroleum emulsion, as well as for red spider and green fly. Sponging with skimmed milk just before the flowers open improves the look of the foliage. Little pruning is needed by old plants except that which they receive when being relieved of their crop of flowers, but specimens which are planted out in prepared beds should be cut into shape each year if they require it, just after flowering is over. The lower branches, too, will need to be tied down a little, as well to keep the centre of the bushes open as to furnish the lower parts of the main stems, which are apt to become bare if the plants are left to themselves.

Principal Species and Varieties :—

- | | |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| florida, Cape Jessamine,
2' to 6', Aug., st., wh.,
fragrant (<i>syn. jasmin-</i>
<i>oides</i>). | — radicans, 1' to 2', Je.,
grh., wh., fragrant ;
major and variegata are
pretty forms. |
| — flore pleno, wh.,
double. | — variegata, lvs. grn.,
margined, yel., wh. ;
otherwise like the type. |
| — fortuneana, Jy., wh.,
larger. | nitida, 3', Oct., Nov., wh. |

Other Species :—

- | | |
|----------------------------------------------------------------------|----------------------------------------------------------------------|
| andrea, 3' to 5', Je., st.,
wh. | stanleyana (correctly Ran-
dia maculata). |
| Rothmannia, 10', Jy., yel.,
with reddish pur. spots,
fragrant. | Thunbergia, 4' to 5', Jan.,
Mch., grh., wh. ; large,
fragrant. |

GARLIC.

The Garlic, *Allium sativum* (*ord. Liliaceæ*) is one of the oldest of garden plants, and has been grown in Britain since the early part of the sixteenth century. It may be grown from seed sown in March, in rather deep drills 1' apart. The plants may be subsequently thinned to 9" asunder. A more common method of propagation is to divide the bulbs, which are compound, and plant the "cloves," or divisions, in the same way as Shallots. The bulbs should be lifted early in autumn, dried in the sun, and stored in a cool, dry shed.

GARRYA.

Exceedingly ornamental evergreen, hardy, or half-hardy shrubs (*ord. Cornaceæ*) with flowers in handsome catkins, and of great beauty on walls or in shrubberies. Propagation, by seeds sown in a frame, or by cuttings of partly ripened wood inserted at the end of summer in sandy soil, under a hand-light or bell-glass, and shaded from strong sun ; also by layers in autumn. Although the Garryas are generally grown on walls, they are even more ornamental in the open. Prune immediately after flowering.

Principal Species :—

- | | |
|--------------------------------------|-----------------------------------------|
| elliptica, 10', spr., yel.,
grn. | Fremontii, 8', spr., grn.,
yel. |
| Fendrena, 8', spr., grn.,
tender. | macrophylla, 6', spr., grn.,
tender. |

Garland Flower (*see Hedychium, Daphne*
Cneorum, and Pleurandra Cneorum).

Garlic Pear (*see Crataeva*).

Garnet Berry (*see Ribes rubrum*).

GASTERIA.

A large genus of succulent plants, closely related to the Aloes, and requiring the temperature of a warm greenhouse. The flowering season of all the forms mentioned here is in the winter months. Propagation, by seeds and offsets. Soil, equal parts of fibrous peat and loam, with a liberal addition of old brick rubbish, broken up to the size of small Hazel nuts. Plenty of water must be given during the summer, and weak liquid cow manure once a week will do good. Scarcely any water is needed in the winter. The plants can scarcely have too much light.

Principal Species :—

- | | |
|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| brevifolia, Jy., red. | pulchra, 6'', sc. (<i>syn. Aloe</i>
<i>maculata</i> of <i>Botanical</i>
<i>Magazine</i> 765). |
| Croucheri, Aug., pale ro.
(<i>syn. Aloe Croucheri</i> of
<i>Botanical Magazine</i>
5812). | verrucosa, 1'' to 2'' (<i>syn.</i>
<i>Aloe verrucosa</i> of <i>Bot-</i>
<i>anical Magazine</i> 837). |
| disticha, sc. : several vars. | |

Other Species :—

- | | |
|------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| acimacifolia, Mch., Sep.,
or. | Lingua of <i>Botanical</i>
<i>Magazine</i> 979). |
| glabra (<i>syn. Aloe carinata</i>
of <i>Botanical Magazine</i>
1331). | nitida (<i>syn. Aloe nitida</i>
of <i>Botanical Magazine</i>
2304). |
| maculata, sc. (<i>syn. Aloe</i> | variolosa, 1' ; close to
maculata. |

GASTROCHILUS.

Herbaceous plants (*ord. Scitamineæ*), requiring stove treatment. Propagation, by division. Soil, mellow loam with coarse sand.

Principal Species :—

- | | |
|-------------------------------------------------|------------------------------------------|
| albo-lutea, 1½', lvs. pret-
tily variegated. | — Jenkinsii, larger, wh.,
tipped red. |
| longiflora, 2', Jy., red,
yel. | pulcherrima, 2', Aug.,
pk., yel. |

GASTROLOBIUM.

A West Australian genus (*ord. Leguminosæ*) of greenhouse evergreens. Propagation, by seeds (when procurable) soaked prior to sowing in heat ; or by cuttings in late spring inserted in very sandy soil beneath a bell-glass. Soil, fibrous peat and loam, with coarse sand. The drainage must be perfect, as the plants will not grow where there is stagnant moisture.

Principal Species :—

- | | |
|-------------------------|---------------------------------|
| bilobum, 2', My., yel. | velutinum, 2', Ap., or. |
| spinosum, 3', Ap., yel. | villosum, 3', My. red,
crim. |

GAUDICHAUDIA.

A genus (*ord. Malpighiaceæ*) of which cynanchoides, a yellow flowering evergreen stove twiner, is the best known. Propagation, by cuttings of ripe shoots in sand beneath a bell-glass over bottom heat. Soil, equal parts of peat and loam, with coarse sand.

GAULTHERIA.

A genus (*ord. Ericaceæ*) comprising both hardy and greenhouse evergreen shrubs. The economic value of the genus lies in the first-named section, as from the fruit of procumbens is expressed an

Gas Stove (*see Heating*).

Gastonia palmata (*see Trevesia palmata*).

Gastrocarpha (*see Moscharia*).

Gastrochilus (*of Don, see Saccolabium*).

Gastroglottis (*see Liparis*).

Gastromeria (*see Melasma*).

Gastronema (*see Cyclanthus*).

Gaten or Gater Tree (*see Cornus sanguinea*).

Gaub, or Gab (*see Diospyros Embryopteris*).

oil used by druggists and perfumers; while from the fruit of Shallon is made a winter bread by the North Americans. Propagation, by seeds and layers. Procumbens prefers a moist position and a peaty soil, but Shallon will thrive in any fertile ground. The compost for the greenhouse species should be mostly peat.

Principal Species :—

fragrantissima, Je., grh.,	wh. The Partridge
wh. (<i>syn.</i> fragrans).	Berry.
procumbens, 6", Jy., hdy.,	Shallon, 4', My., hdy., wh.

Other Species :—

antipoda, 6', spr., grh.,	nummularioides, spr., wh.
wh.	or pk. (<i>syns.</i> Nummularia and repens).
bracteata, Jy., red.	

GAURA.

Pretty annual or perennial herbs and shrubs (*ord.* Onagraceæ). The best is Lindheimeri, a perennial, but tender, and best treated as an annual. Propagation, by seeds sown under glass in early spring, the seedlings being hardened off and planted out at the end of May. Some sow in the open and protect in severe weather. They like a dry, light soil.

Principal Species :—

angustifolia, 2', Aug.,	mutabilis, 1½', Jy., ann.,
per., pk. (<i>syn.</i> fruticosa).	yel.
biennis, 5', Aug., bien.,	parviflora, 1½', Aug., ann.,
wh., red.	yel.
coccinea, 1', Aug., per.,	sinuata, 2', Jy., bien.
sc.	tripetala, 1½', Aug., ann.,
Lindheimeri, 4', Je., per.,	pk.
ro., wh.	

GAUSSIA.

A small genus (*ord.* Palmæ) of stove Palms, that are raised from imported seeds and thrive best in mellow loam. The known species are Ghiesbreghtii and princeps, both fairly tall, Areca-like plants.

GAYLUSSACIA.

Most of these evergreens (*ord.* Vacciniaceæ) are only half-hardy, and if grown out of doors in summer they must be afforded the protection of a greenhouse or pit in winter. Propagation, by seeds or layers. Soil, three parts of peat, one part of loam, one part of leaf mould, and coarse sand.

Principal Species :—

brachycera, 1', My., wh.	places, pur., grn. (<i>syns.</i>
(<i>syn.</i> Vaccinium buxifolium).	Vaccinium frondosum
dumosa, 3' to 5', My., Je.,	[L.], glaucum, and
ro. red (<i>syns.</i> Vaccinium dumosum and frondosum, Michaux).	venustum).
frondosa, 3' to 5', My.,	resinosa, 2½', My., Je.,
Je., hdy. in most	hd. in many places,
	ro. red (<i>syns.</i> Vaccinium parviflorum and resinosum).

GAZANIA.

Brilliant, half-hardy plants (*ord.* Compositæ), very ornamental in a cool greenhouse, or planted out in sunny beds or borders in summer. From ringens and uniflora several beautiful hybrids have been raised, and newer varieties are being introduced by Italian raisers. Propagation, by cuttings of the small side shoots, struck in a close frame in sand and peat, in July or August. These must be carefully wintered. Soil, loam with a little peat. Some of the Gazanias are almost hardy, but it is safer in cold localities to keep them where they can be protected from frost, such as in a heated frame or cold house.

Principal Species :—

bracteata, 6", Jy., wh.,	pygmaea, 1', Jy., or. (<i>syn.</i>
yel. (<i>syn.</i> nivea of garden).	bracteata).
longiscapa, 9", Jy., yel.	ringens, 1', Je., yel., blk.
montana, 3", Jy., yel.	central band (<i>see figure</i>).
Pavonia, 1½', Jy., yel.,	splendens, 1½', Jy., or.,
spotted br.	spotted blk. and wh.;
pinnata, 1', Jy., yel.	supposed hybrid.
	subulata, 1', Jy., yel.
	uniflora, 1', Jy., yel.

GAZANIOPSIS.

A small genus (*ord.* Compositæ) of half-hardy perennials. Propagation, by seeds or cuttings under a hand-light. They thrive in an open sunny position, in any well-drained, fertile soil.



GAZANIA RINGENS.

Principal Species :—

stenophylla, foliage yellowish above and wh. beneath.

GEISSOIS.

A stove evergreen tree (*ord.* Saxifrageæ) that produces racemes of flowers on the old wood; it is highly ornamental. Propagation, by cuttings in sand beneath a bell-glass over bottom heat. Soil, loam and peat, with abundance of sand.

Principal Species :—

racemosa, 15', sum., crim.

GEISSOMERIA.

Evergreen stove shrubs (*ord.* Acanthaceæ). Propagation, by cuttings in sandy soil beneath a bell-glass over bottom heat. Soil, loam, leaf mould, decomposed cow manure, and sand.

Principal Species :—

aurantiaca, 3', Aug., or.	coccinea, 2½', aut., sc.
sc.	nitida, 3', sum., dark red.

Gaya (*see Seringia*).

bavarica, 3'', Jy., bl.
 brevidens, 9'', Aug., bl.
 Burseri, 1', Jy., bl.
 calycosa, 6'', bl., wh.
 campestris, 4'', Aug.,
 ann., pur.
 decumbens, 9'', Je., bl.
 Elliottii, 9'' to 24'', Sep.,
 bl.
 Fetisowi, 1', Jy., bl.
 frigida, 3'', Jy., wh.
 gelida, 1', Jy., bl.
 imbricata, 3'', Jy., bl.
 Kesselringii, 8'', Jy., wh.,
 bl.
 Kurroo, 6'', Aug., bl., wh.
 macrophylla, 1', Jy., bl.
 ochroleuca, 2', Aug., bl.

ornata, 4'', My., bl.
 Parryi, 1', sum., bl.
 pannonica, 9'', Jy., bl.
 phlogifolia, 6'', Je., bl.
 Pneumonanthe, 6'', My.,
 bl.
 — alba, wh.
 punctata, 3'', Jy., yel.
 purpurea, 3'', Jy., bl.
 pyrenaica, 3'', Ap., bl.
 Saponaria, 2'', Aug., bl.
 — alba, wh.
 scabra, 1', lil. (*syn. For-*
tunei).
 tibetica, 1', sum., wh.
 triflora, 9'', Jy., bl.
 Walujewi, Je., pale bl.,
 wh.

Limes. Besides spraying to kill the caterpillars in spring, grease banding late in October is a preventive, as it obstructs the passage of the wingless females up the trees to deposit their eggs. Another species attacks Conifers.

GEONOMA.

Dwarf, elegant Palms (*ord. Palmæ*), of somewhat slow growth. One species, *gracilis*, was formerly a popular table plant, but of late *Cocos weddelliana* has displaced it. Propagation, by seeds sown in pans in bottom heat. All are stove plants, needing good loam mixed with a little leaf mould and sand. Use small, well-drained pots; sponge and syringe the plants frequently. Keep them as near the glass as safety permits.



Photo: S. Faver, Westgate-on-Sea.

"GERANIUMS" (ZONAL PELARGONIUMS) ON A TRELLIS, AFTER REMAINING OUT OF DOORS ALL THE WINTER.

GEODORUM.

A comparatively small genus of East Indian Orchids (*ord. Orchidaceæ*) that are terrestrial, and need stove culture. They produce rather large leaves and erect spikes, and have tuberous root-stocks. Increased by division. Well-drained pots and a compost of fibrous loam and chopped sphagnum will suit them.

Principal Species :—

candidum, 1½', sum., wh. citrinum, 1½', aut., yel.
 dilatatum, 1', sum., pk.

GEOMETRA.

A genus of moths, several of which are only too well known to gardeners. The Pale Brindled Beauty (*polosaria*) attacks the young foliage of many trees, and must be combated in the same way as the Lackey Moth. The Mottled Umber (*defoliata*) is a voracious feeder on Apples and

Principal Species :—

gracilis, 6'. martiana, 12'.
 princeps, 6'; compact.

Other Species :—

acaulis, 6'. imperialis, 10'.
 Carderi (correctly Prestoia Carderi). pumila, 5'.
elegans, 8'. schottiana, 8'.
fenestrata (correctly Malortica *gracilis*). Seemannii, 10'.
ghiesbreghtiana (correctly *Calyptrogyne ghiesbreghtiana*). speciosa, 6'.
 zamorensis, 6'.
spixiana, 15'.

GERANIUM. (CRANE'S BILL.)

Showy, hardy or half-hardy, annual or perennial plants (*ord. Geraniaceæ*), quite distinct from the

Geophila (of Berger, see *Merendera*).

Georchis (see *Goodyera*).

Georgina (see *Dahlia*).

Zonal Pelargoniums, popularly called "Geraniums," and of value for borders or rockwork. Propagation, by seeds sown in the open or under glass in spring, and by division in spring or autumn. Some may be propagated by cuttings of the side shoots struck in sandy soil under a hand-light. Any common soil.

Principal Species and Varieties :—

argenteum, 3', Je., pale red. A charming Alpine, silvery lvs. Place a piece of glass over it in win. to throw off rain.
armerum, 2', Je., pur.
Endressii, 1', Je., ro.
ibericum, 1', Je., bl.
sanguineum, 1½', Je., crim.
— album, wh.
— lancastriense, ro.
wallichianum, Je., pur.; trailer.

Other Species :—

affine, 1', Je., bl.
albanum, 1', My., pur.
albiflorum, 1½', Jy., wh.
anemonefolium, 1½', My., hlf-hdy., red.
atlanticum, 1½', Je., hlf-hdy., pur.
balkanum, 1', Je., pur.
cinereum, 1', Aug., red.
collinum, 1', Jy., pur.
dahuricum, 1', Jy., pur.
eriosomon, 1½', Jy., bl.
grevilleanum, 1', Jy., red.
lucidum, 6'', Je., pk.
macrorhizon, 1½', Je., pur.
maculatum, 9'', Jy., pur.
multifidum, 1', Aug., hlf-hdy., red.
nepalense, 6'', Je., red.
palustre, 1½', Jy., pur.
phaum, 1½', My., pur.
pratense, 2½', Je., bl.
pyrenaicum, 1', Je., pur.
robertianum, 1', Ap., red.
sibiricum, 1', Jy., wh.
striatum, 1', Aug., wh., red.
sylvaticum, 2', Jy., pur.
tuberosum, 1', Jy., pk.
wassovianum, 1', Jy., red.

GERANIUM, ZONAL. (ZONAL PELARGONIUM.)

Description.—Though, to be botanically correct, the plants here referred to should be grouped as Pelargoniums, they are so generally known as Zonal Geraniums (*ord.* Geraniaceæ) that no apology for dealing with them as such is needed. All are perennial, free flowering, adapted to many methods of cultivation, and produce flowers in large trusses on erect stalks. The foliage is generally modified heart-shaped, and with few exceptions the leaves have a band or zone of a darker colour than the rest of the leaf. Some varieties with tricolor, silver, bronze, or yellow leafage have been developed, and these were greatly in demand when summer bedding was the height of horticultural fashion.

History.—Zonal Geraniums are the creation of florists. The parent species (*Pelargonium zonale*) was introduced about 1710. No doubt *P. inquinans* was used in the earlier stages in conjunction with *P. zonale*, but for years past improvement has been by cross fertilisation and rigid selection, the aim being to secure sturdiness, fine form, large truss, and floriferous habit. In colour the aim has been chiefly towards clear, decided shades, and especially towards a real blue and a bright yellow. Both are yet to find.

Propagation.—The most popular method is by cuttings cut straight across the stem just beneath a joint, and with the lower leaves trimmed off. To increase a new variety, or to make up the required number of any bedding sort, cuttings may be struck in moderate heat and subsequently given cooler quarters. Cuttings can be rooted in pots or boxes of light soil placed in a greenhouse, or even a cottage window, at any time from spring to autumn, provided the soil is not kept very moist.

Soil and Potting.—Good loam is the best potting material, and beyond a little sand it needs no addition; but if the loam lacks fibre add some decayed leaves, dried cow manure, or wood ashes. It is far

better to feed the plants when they are thoroughly well rooted and commencing to bloom, either by top-dressings or with liquid manure, than to pot them in a rich material, as the latter causes rank, long-jointed growth and few flowers. Firm potting is a point to be well observed.

Other Cultural Points.—Damp being the greatest enemy during winter, it is necessary to give water only early on bright days. Afford all the light possible, and remove decaying leaves. Avoid coddling.

For Winter Flowering.—Cuttings may be rooted singly in small pots during late autumn or in early spring, the latter for choice. The plants ought to be ready for potting into 6" pots by the end of May, and after a few days' sojourn in a close pit to assist the formation of new roots, the best place for them is an open one. They enjoy full sunshine, though it is an advantage to the plants and a saving of labour in watering to the grower if a thick board is placed on edge against the pots. About the middle of September place the plants in an airy greenhouse, raise them near the glass, and keep up a temperature of 45° to 50°. Pinch out the bloom trusses until September, in the case of the earliest batch, and still later on those not required to flower so soon. Two months at least must be allowed from the formation of new flower buds to the period of flowering, during the dull months of the year. It is far better to grow large batches of a few distinct-coloured varieties for this purpose, than to attempt the cultivation of a collection.

Standard Geraniums.—These are becoming popular for the decoration of large conservatories, corridors, verandahs, and terraces. A couple of seasons are required to secure the necessary length of stem and a good head, but after these are obtained it is only necessary to occasionally repot and to annually prune the heads into shape. Winter in a cool greenhouse, and keep moderately dry. In summer give liquid manure. Stout Bamboo rods are by far the best supports.

Selection of Single Varieties :—

Crimson Shades :—

Dr. Macdonald.	Lord Rosebery.
John Forbes.	Marquis of Dufferin.
King of Crimson.	M. Calvat.

Orange Shades :—

Golden Horn.	Lady Churchill.
Jerome K. Jerome.	Sunbeam.
John Ruskin.	Wordsworth.

Pink and Blush :—

Duchess of Fife.	Norah.
Gertrude Pearson.	Olive Carr.
Lady Roscoe.	Stella Massey.

Purple and Magenta :—

Bluebeard.	King of Purples.
Blue Peter.	Lord Roberts.
Kaiser Frederick.	Royal Purple.

Rose :—

Alfred Tennyson.	Hall Caine.
Countess of Buckingham.	Lady Frances Russell.
Duchess of Portland.	Mrs. Wildsmith.

Salmon :—

Coleridge.	Lady Laurier.
Connan Doyle.	Mary Pelton.
Ian Maclaren.	Mrs. Chas. Pearson.

Scarlet Shades :—

Charles Mason.	Southey.
General French.	Souv. de W. B. Miller.
George Gordon.	W. P. Wright.

Striped and Shaded :—

Countess de Morella.	Mark Twain.
Exposition de Lyon.	Menelik.
Lady Sarah Wilson.	Souv. de Mirande.

White :—

Amy Amphlett.	Niphetos.
Eucharis.	Snowstorm.
Niagara.	Virginia.

Selection of Double Varieties :—*Crimson :—*

Chas. Lalande.	Double Henry Jacoby.
Colóssus.	General Millet.
Commander-in-Chief.	Leonard Kelway.

Orange :—

Californie.	Golden Gate.	Golden Rain.
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Pink and Blush :—

Ami Henriot.	Lord Derby.
Comtesse de Clinchamp.	Mdme. Vaudrey.
Jeanne d'Arc.	Rosa Bonheur.

Purple and Magenta :—

Aglaia.	Larkand.
Alsace Lorraine.	Ludovic Corret.
A. Rouillard.	Petit Jean.

Rose :—

Apotheose.	L. Contable.
Catulle Mendès.	Mdme. Grillot.
Jean Picard.	Pierre Loti.

Salmon :—

Anna Bateson.	Pallas.
Diego Podda.	René Bazin.
King of Denmark.	Sam. Jacoby.

Scarlet Shades :—

Duke of Fife.	Raspail Improved.
Gorgeous.	Scarron.
Ludwig Ferchl.	Turtle's Surprise.

Striped and Shaded :—

Apricot.	Jean Rameau.
Girome.	Mdme. H. Tilmant.
Huber Charron.	Sir Hamilton.

White :—

Baronne de Layres.	Hermione.
Boule de Neige.	Miss G. Ashworth.
Hedwidge Buchner.	White Abbey.

Selection of Bedding Varieties :—*Crimson :—*

Etna.	George Potter.	Henry Jacoby.
		[Wales.]

Orange :—

Decorator.	Mrs. E. Rawson.	Princess of
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Pink and Blush :—

Beckwith's Pink.	Lady Bailey.	Olive Carr.
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Purple and Rose :—

Kaiser Frederick.	Miss Blanche	M. Porrier.
	Gordon.	

Salmon :—

Iseult.	Omphale.	Surprise.
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Scarlet :—

Havelock.	Vesuvius.	[Gem.] West Brighton
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White :—

Eucharis.	Niphetos.	Snowdrop.
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Selection of Bright-foliaged Varieties :—*Golden Bronze :—*

Distinction.	Her Majesty.	Wm. Sandy.
Golden Harry	Jubilee.	Zulu.
Hiever.		

Golden Tricolors :—

Enchantress.	Mr. Henry Cox.	Peter Grieve.
Masterpiece.	Mrs. Pollock.	Prince of
		Wales.

Silver Tricolors :—

Dolly Varden.	Eva Fish.	Mrs. Clutton.
Empress of India.	Lass o' Gowrie.	Mrs. Miller.

Yellow :—

Crystal Palace	Robert Fish.	Vérona.
Gem.		

White and Silver :—

Boule de Neige.	Flower of Spring.	Miss Kings-
		[bury.]

GERBERA.

By reason of its bright, orange-coloured flower heads, Jamesoni has of late become popular. It is a greenhouse perennial (*ord.* Compositæ); but is often grown outdoors in sheltered borders. Soil, loam, leaf mould, and sand. Propagation, by seed, or cuttings of basal growths.

Principal Species :—

asplenifolia, 1', hlf-hdy.,	or., sc. (<i>see</i> figure).
pur.	Barborton Daisy.
Jamesoni, 18", sum., aut.,	



GERBERA JAMESONI.

Other Species :—

kunzeana, 1', sum., hdy.,	viridifolia, 1', sum., hlf-
wh.	hdy., wh., yel.
lanuginosa, 1', sum. hdy.,	
wh.	

*Gerdaria (see Sopubia).**German Catchfly (see Lychnis).**Germander (see Veronica and Teucrium).**Geropogon (see Tragopogon).**Gersinia (see Bulbophyllum).*

GERRARDANTHUS.

A greenhouse climber (*ord.* Cucurbitaceæ), easily raised from seeds sown in heat. Soil, rich, light loam.

Principal Species :—
tomentosa, Aug., yel.

GESNERA.

Description.—A fairly large genus (*ord.* Gesneraceæ) of tuberous-rooted, stove or intermediate house plants, that have downy stems and leaves, and are of dwarf habit. The flowers are more or less tubular, pendent or semi-pendent, and usually very brilliantly coloured or spotted. Most of the hybrids and named varieties have been raised on the Continent.

Propagation.—By methods similar to those employed for Gloxinias, the usual one being division of the tubers as soon as growth commences. In a close, moist case, neither growth nor leaf cuttings are difficult to root. Seedlings can be raised in heat if the seed is sown on the surface of fine, sandy soil, and covered with a glass. Sow early in February.

Soil.—Two parts of good, light loam, one part of fibrous peat, and one part of leaf mould, with a little dried and sifted cow manure, and sharp sand.

Other Cultural Points.—Tubers should be started, as in the case of Gloxinias, and potted as soon as fit. When rooting freely, a shelf in an intermediate temperature will suit admirably until increased growth makes a position on the stage below necessary. Water freely, and maintain a humid atmosphere.

Insects and Diseases.—Thrips will soon disfigure the foliage, but if a properly moist atmosphere is maintained they are no trouble. Green fly can be kept at bay by periodical fumigation. A kind of dry rot sometimes attacks the tubers. It seems to be brought on by unduly hastening the period of rest, or by a low temperature during that period, and when once it sets in there is no cure.

Principal Species and Varieties :—

Blassii, 1', sum., sc. (*syn.* maculata, 1½', aut., pur. spotted (*syn.* purpurea, cardinalis, 1½', aut., crim., verticillata, and Dirceæ sc., wh. throat (*syn.* picta).
lateritia, macrantha, and Dirceæ cardinalis).
Donkarii, 2', Jy., red., throat yel.
Douglasii, 1½', Sep., red, yel.
exoniensis, 1½', win., or., sc., yel.; hybrid.
lateritia (*Pacton*, see cardinalis).
Leopoldii, 1', sum., sc.
Lindleyi, 1½', Jy., sc., yel. (*syn.* atrosanguinea).
macrantha (see cardinalis).

Other Species and Varieties :—

allagophylla, 1½', Jy., or. bulbosa (see magnifica).
cinnabarina (see Nægelia cinnabarina).
cochlearis, 2', Je., sc.
Cooperi, 2', Je., sc.
discolor, 1½', Sep., red, yel. (*syn.* polyantha).
elongata, 2', aut., sc.
Hookeri, 1½', sum., sc.
libanensis (see Pentarrhaphia libanensis).
longiflora (see Achimenes longiflora).
magnifica, 1½', Aug., pur. polyantha (of *Botanical Magazine*, see discolor).
rupestris (see tuberosa).
rutula, 2', Aug., sc., yel.
sceptrum, 3', Jy., sc.
schiediana (see Isoloma schiedianum).
Suttoni, 2', Aug., sc.
tuberosa, 6", aut., sc. (*syn.* rupestris).

tubiflora, 2', Mch. (now Achimenes tubiflora).
verticillata (see maculata).
vestita (see Isoloma vestitum).
zebrina (see Nægelia zebrina).

GETHYLLIS.

South African bulbous greenhouse plants (*ord.* Amaryllidæ). Propagation, by seeds and offsets. Soil, peat, loam, and sand. A distinct resting period must be allowed after flowering, gradually reducing water, and giving little or none in winter.

Principal Species :—

afra, 6', Jy., wh., red. (now Apodolirion lancilicaris, 6", Jy., wh.
lanceolata, 7', Jy., wh. spiralis, 9', aut., wh.

GEUM. (AVENS.)

Pretty, hardy, herbaceous plants (*ord.* Rosaceæ) for borders and rockwork. Propagation, by division in spring or autumn, by seeds sown in a frame or in pots in a greenhouse in early spring. Common soil.

Principal Species and Varieties :—

chiloense, 2', Je., sc.; — miniatum, or. often known as coccineum. — montanum, My., yel.; a good plant.
— grandiflorum plenum; — grandiflorum; superior. good for cutting. — Heldreichii, or., red.

Other Species :—

album, 1', Jy., wh. rhaeticum, 4', Je., yel.
coccineum, 1', Jy., sc. rivale, 1½', Je., red, pur.
elatum, 1½', Jy., yel. Water Avens.
japonicum, 1½', Je., yel. Roylei, 1½', Je., yel.
macrophyllum, 2', Jy., yel. sylvaticum, 1', Jy., yel.
molle, Je., 1½', yel. (*syn.* atlanticum).
pyrenaicum, 1', Jy., yel. triflorum, Je., red.
reptans, 6", Je., yel.; tyrolense, 1½', Je., yel.
var. flore pleno. urbanum, 1½', Je., yel.

GEVUINA (*syn.* GUEVINA).

A South American genus (*ord.* Proteaceæ), one species only, Avellana, being known. It makes a tree 30' to 40' high, with whitish flowers and red fruit. It should be grown in sandy peat and loam in a cool greenhouse, or frame, standing out of doors in summer. This is the Guevina of the *Kew Hand-List*, not of the *Index Kewensis*.

GILIA.

Beautiful annual or half-hardy perennial nerbs (*ord.* Polemoniaceæ), very ornamental in beds or borders, or on rockwork. Propagation, by seeds in the open in April, or in a frame a little earlier. They like a rather light soil. The few perennial species require to be kept free from rain. Unless otherwise marked, those named are annuals. The genus Leptosiphon, which is referred by botanists to Gilia, is treated under its garden name in this work.

Principal Species :—

achilleefolia, 1', Aug., pur., bl.; vars. with wh. and red flowers are as pretty as the type.
androsacea, 9", Aug., lil., pk., ro., wh. tricolor, 1', Je., various; valuable, many beautiful vars., hybrid, useful garden forms.

Gethyra (see Rencaimio).
Getonia (see Calycoperis).
Gherkin (see Cucumber).
Ghiesbreghtia (see Calanthe).
Ghinia (see Tamonea).
Giant Fennel (see Ferula).
Gias (see Beta).
Gibraltar Mint (see Mentha).
Gigantabies (see Sequoia).

Other Species :—

aggregata, 9", Jy., bien.,
sc.
Brandegei, 9", Jy., per.,
yel.
californica, 1', Jy., hlf-
hdy. per., lil.
capitata, 1' to 2, sum.,
bl.
dianthoides, 6", Jy., lil.

dichotoma, 9', Jy., wh.
laciniata, 9", Jy., pur.
liniflora, 1', Jy., wh.
micrantha, 9", Jy., ro.
parviflora, 1', Aug.,
pur., or., bl. (*syn.*)
inconspicua).
squarrosa, 1', Jy., bl.
tenuiflora, 1', Aug., vio.



Photo : Cassell & Company, Ltd.

GLADIOLUS ALTHEA (see p. 370).

GILIBERTIA.

Stove evergreen shrubs (*ord.* Araliaceæ), increased by cuttings of the young wood in very sandy soil beneath a bell-glass over bottom heat. Soil, fibrous loam, peat, and coarse sand.

Principal Species :—

brasiliensis, 5', aut., grn., umbellata, 5', grn.
yel.

GILLENIA.

Graceful, hardy perennial, herbaceous plants (*ord.* Rosaceæ), which make a pleasing effect in the border or large rock garden. The two species are much alike, and are easily grown in any common soil, not very dry. Propagation, by division or seeds in spring.

Only Species :—

stipulacea, 3', Jy., red, trifoliata, 3', Jy., red, wh.;
wh. var. major is taller.

GILLIFLOWER.

This popular name, sometimes rendered Gilly-flower, or Gilloflower, is applied to two very distinct flowers, *i.e.* the Carnation and the Wall-flower. It belongs, however, rightly to the former, and was so used by the old herbalists. The word itself is probably a corruption of the French *giroflée* or *girofle*, though one old writer suggests a different derivation by calling Carnations "July-flowers."

GINGER.

So cheap has preserved green Ginger become that few attempt the cultivation of *Zingiber officinale* (*ord.* Scitamineæ) for the sake of its fleshy rhizomes, though some grow it as a foliage plant. Given a deep pit and plenty of bottom heat, home grown Ginger equal to the imported produce may be obtained. Roots must be divided early in spring, and may either be potted and the pots placed in a plunge-bed of spent tan, or planted in a bed of rich soil made up on slate slabs laid over the bottom heat pipes. Water must be given sparingly until growth is well advanced, after which it is scarcely possible to give too much moisture until growth ceases for the season.

GINKGO.

Few trees are handsomer than the Maidenhair Tree, and few are better able to withstand the effects of town dust and smoke. *Ginkgo biloba* (*ord.* Coniferae) grows slowly, but attains to a considerable height, and lives to a good old age. It grows in any good garden soil, and is propagated by seeds.

Only Species :—

biloba, 75', spr., grn., yel. (*syn.* *Salisburia adiantifolia*). There are several garden forms, with descriptive varietal names, such as *fastigiata*, *macrophylla laciniata*, *pendula*, *triloba*, and *variegata*.

GIPSY MOTH.

Although still very destructive, on the Continent, to various fruit trees, Poplars, Willows, Roses, Oaks, etc., the Gipsy Moth, *Liparis* (or *Bombyx*, or *Porthetria*) *dispar*, is now so scarce in this country that it does little harm. The male is smaller than the female, very dark, and dull brown in colour; the female is grey, and has a very downy body. The eggs are deposited on tree trunks, and the pupæ are placed in a web among leaves, or some other snug spot. Spring and winter dressings should be given to fruit trees where the Gipsy Moth proves a pest. (See INSECTICIDES).

Gingelly Oil Plant (see *Sesamum indicum*).

Ginger Beer Plant (see *Torula*).

Ginger, Wild (see *Asarum europæum*).

Ginginsia (see *Pharnaceum*).

Ginseng (see *Panax*).

Gipsies' Rose (see *Scabiosa arvensis*).

Gissanthe (see *Costus*).

GLADIOLUS. (CORN FLAG. SWORD LILY.)

Description.—The Gladiolus is so familiar to all that a detailed description is unnecessary. It will be sufficient to say that it belongs to the *ord.* Iridæ; that there are over 130 species; that it has a corm, as its "bulb" is called; and that it produces its flowers in spikes. Our garden Gladioli are principally hybrids, but a number of the species are of much beauty, and will give considerable pleasure to those who grow them. A selection of the best or most interesting of these species is appended. All the Gladioli are useful as cut flowers, and if cut when the lower flowers begin to open the remainder will last much longer in water.

Propagation.—The original corm dies annually, but another is produced in its place, and sometimes more than one, which can be separated before planting time. The principal method for increasing any named or choice varieties is by means of the cormlets or "spawn" produced at the base of the larger corms. These are grown in small beds, and eventually attain to flowering size. They should be lifted annually in a similar manner to the larger ones. Where a corm shows more than one "eye" on the top, it may be cut into as many pieces as there are eyes, just like a Potato, and each piece will produce a stem. The cut must be right through the corm to the bottom, and it is desirable, though not necessary, to put some powdered charcoal on the cut portion. New varieties are raised from seeds sown in beds in the open or in pans under glass.

Soil.—The Gladiolus may be grown on any good soil enriched with manure. Some recommend a light soil, but capital spikes and good corms are produced on heavier land.

Other Cultural Points.—Only a few Gladioli, principally natives of Europe and Asia Minor, are hardy in the greater portion of these islands. The others are best treated as half-hardy, that is, lifted in autumn when the leaves become yellow, and stored in a cool place where frost cannot reach them until the time for replanting comes round. The cormlets should not be taken off until that time. After lifting, the corms ought to be dried slightly in an airy place out of the sun, and then placed in drawers or, in the case of a small collection, in paper bags. A good number of the early-flowering varieties are hardy once they become established, if left in the open ground, but for the first winter or two it is more prudent to cover them with 2" or 3" of Cocoanut fibre refuse or ashes.

Growing for Exhibition.—The corms may be planted in lines, the plants being about 1' apart. The beds ought, if possible, to be prepared in autumn, a good addition of cow or horse manure being made at that time. The proper depth to plant is about 3" above the top of the corm, and a little sharp sand may be placed about it when the soil is of a heavy nature. For the decoration of mixed borders the corms may be closer, and look best in groups. From the beginning of March to the end of May is the most suitable time to plant, but in cold districts it is often desirable to place the later varieties in boxes, like those used for early Potatoes, with some soil about the corms, and to start them into growth before planting them out, this being done with the soil adhering to the roots, which must not be injured. The plants ought to be secured to stakes as soon as they have grown sufficiently high, and be kept attended to in this respect as the spikes extend. In poor soil the

beds may be mulched with well-rotted manure when the Gladioli are a little above the surface. Some apply artificial manures or water occasionally with liquid manure, but on a somewhat heavy yellow loam Mr. J. Burrell, a noted grower, finds that both of these give doubtful results. Flowers for exhibition are covered with a box with a glass front, the lower part of which is shaded as the blooms at the base of the spike open. For beds and borders good strains of seedlings will give



Photo: Cassell & Company, Ltd.

GLADIOLUS MRS. WOOD (see p. 370).

many fine flowers, some of these being equal to named varieties. Gladioli are very ornamental in pots, one corm for a 6" pot being sufficient, except for the smaller forms, such as Colvillei and the other early-flowering varieties, which may be placed five to a 6" pot. Two parts of rich loam, with one part of decayed hotbed manure and a little sand, will make a good compost for these. Recently some of the later Gladioli have been successfully forced, but they require careful attention, and are scarcely suitable for ordinary glass structures. The Gladiolus is subject to fungoid diseases, but no remedy has yet been discovered.

Selections :—

Gandavensis Section :—

The first Gladiolus of this section, the most important for show and garden purposes, is said to have originated at Enghien, but was sent out from Ghent, whence its name *gandavensis*. It is understood to have been raised from *psittacinus*, hybridised with *cardinalis*, though Dean Herbert concluded that *oppositiflorus* was used instead of *cardinalis*, and Mr. Burrell is of opinion that this was used by M. Souchet in raising some of the many fine hybrids of his time. The improvement in these flowers continues to advance, and the Kelways of Langport, and the Burrells of Cambridge, are among the greatest raisers of the present day. The flowers are of charming form and colouring, and even the old scarlet *branchleyensis* is indispensable for its brilliant flowers, which are of striking effect when contrasted with white-flowered plants. The first selection is of good exhibition flowers, and the second is made from new Gladioli which have taken high awards from the Royal Horticultural Society within the last few years.

First Selection. Good Exhibition Flowers :—

Aldebaran.	Dr. Olmstead.	M. A. Brongni-
Baroness Burdett-	Enchantresse.	art.
Coutts.	Eugene Souchet.	Mr. Jansen.
Beatrix.	Fantôme.	Mr. Patrick.
Corinne.	Formosa.	Mrs. Wood (see
Cronstadt.	Grande Rouge.	p. 369).
Dalila.	Grand Vainqueur.	Osmani.
Dr. Bailly.	Hamlet.	Pollux.
Dr. Jules Mascarel.	L'Incendie.	Sultana.
	Mme. P. Palmer.	Zampa.

Second Selection. Recent Novelties :—

Althæa (see p. 368).	Countess of	Lady Montagu.
Apollo.	Leicester.	Ocean.
Burne-Jones.	delicata.	Mike Lambourne.
Carlton.	F. Paynter.	Penn.
Carlyle.	Jas. H. Veitch.	Sir Evelyn Wood.
Countess Amy.	Jules Toussaint.	Victor.
		W. B. Child.

Lemoinei Section :—

These were raised by M. Lemoine, of Nancy, France, by hybridising *gandavensis* and others with *purpureo-auratus*. They are distinguished by deep-coloured blotches at the bases of the lower segments. Some pretty flowers are found among these, and recently seedlings have been raised with blue or bluish flowers. They are slightly harder than the *gandavensis* vars.

Selection of Good Varieties :—

Baron J. Hulot.	Henriette Renan.	Paul Lemoine.
Deuil de Carnot.	Hippolyta.	Prof. Le Monnier.
Docteur Regel.	Jane Dieulafoy.	Rev. W. Wilks.
Emile Augier.	J. H. Krelage.	Senateur Volland.
Fustell de Cou-	J. J. Weiss.	Vesuve.
langer.	Mad. Desbordes	W. E. Gumbleton.
Gil Blas.	Valmore.	Xenia.

Nanceianus Section :—

These originated, from crosses between the Lemoinei and *gandavensis* vars., with M. Lemoine, at Nancy. They are splendid garden plants, with tall spikes and large flowers.

Selection :—

A. R. Smith.	Le Grand Carnot.	Professeur Lam-
Col. Archinard.	Massena.	bin.
Col. Gillon.	President Carnot.	Robert Lindsay.
General Duchesne.	President Chan-	W. Watson.
Jules Finger.	don.	

Childsii Section :—

These were raised by Herr Max Leichtlin, of Baden-Baden, but passed by purchase into American hands. They are seedlings of *Saundersii*, crossed with *gandavensis*. They have large, showy flowers on tall stems.

Selection :—

Ben Hur.	Gildo.	Mrs. La Mance.
Cavour.	Henry Gillman.	Splendour.
Dr. Sellow.	Mrs. Beecher.	Wm. Falconer.

Early-flowering Section :—

These are of various parentage, a few being original species. They are very useful, and some are scarcely inferior to *gandavensis* vars.

Selection :—

Ardens (syn. Fire King).	communis (in var. iety).	Ne Plus Ultra.
blandus (in var. iety).	delicatissima.	Prince of Wales.
Blushing Bride.	Duke of Albany.	Queen Victoria.
cardinalis.	floribundus.	Queen Wilhelmina.
Colvillei.	formosissimus.	ramosus (in var. iety).
— The Bride.	ineignis.	Rosy Gem.
	nanus (in var. iety).	Salmon Queen.
		Sarnian Gem.

Principal Species :—

Unless otherwise mentioned, these may be grown in frames or treated like the others.

Selection :—

alatus, 6", red.	illyricus, 1½', hdy., pur.
armeniacus, 1', Jy., hdy., pur.	kotschyanus, 1½', hdy., pur.
atroviolaceus, 1', hdy., pur.	oppositiflorus, 2½', wh.
byzantinus, 2', hdy., pur.	psittacinus, 3', yel., red.
cruentus, 2½', sc.	purpureo-auratus, 2', yel.
dracocephalus, 2' to 3', pale yel., pur.	Saundersii, 2', sc., wh.
	segetum, 1½', hdy., pur.
	tristis, 1½', pale yel.

GLASS AND GLAZING.

Twenty-one ounce glass is the best for horticultural purposes, as not only is it stronger than lighter makes, but it also keeps out the cold better. Green tinted glass was at one time recommended for horticultural purposes, but it is now seldom used, except for Filmy Ferns and a few other shade loving plants. To deal with the multitudinous systems of glazing would occupy more space than can be afforded here. There are lead and copper glazing, by means of S-shaped strips of metal which firmly grip the under and overlapping edges of the panes. In Beard's system strips of felt are laid on the sash bars, and on them the glass is placed; other strips of felt are then laid on the glass, and over this a wood or metal cap, as wide as the sash bar, is screwed down. No putty is used. In Rendle's system the glass is so arranged that hardly any woodwork is exposed externally, and outside painting is almost unnecessary. The most general system of glazing is still by means of putty, but top putty is now seldom used, owing to the difficulty experienced in removing broken panes. The rebates should be well filled with good putty, on to which the glass is firmly pressed; lightly sprig the panes to prevent movement, and then allow the putty to dry. The next point is to give two or three coats of paint instead of top putty, allowing these to extend ¼" over the glass on each side. To prevent damage by contraction, cut the panes ⅛" less in width than is the distance between the sash bars or astracles.

Gland. Bellflower. (see Adenophora).

Glandulifolia (see Adenandra).

Glaphyria (see Leptospermum).



A GROUP OF GLADIOLI.

GLASTONBURY THORN.

This famous *Cratægus* is a precocious form of the common Hawthorn, and one that frequently flowers as early as December. Its botanical name is *Cratægus Oxyacantha præcox*. So early flowering

GLAUCIUM. (HORNED POPPY.)

Showy hardy biennial or perennial flowers (*ord.* *Papaveracæ*), suitable for borders or rockwork. *Flavum* is the native species, and grows on the sea shore in sandy soil. The plants will, however,



Photo: Cassell & Company, Ltd.

GLEDITSCHIA TRIACANTHOS (see p. 372).

a shrub as this was regarded by the ancients with superstitious awe, and consequently many legends are connected with the plant. William of Malmesbury tells how Joseph of Arimathea visited England, bearing the Holy Grail with him, and founded at Glastonbury (in Somersetshire) the first Christian church of Britain. Arrived at Wearyall Hill, the pilgrim thrust his staff into the ground, when it speedily rooted, and blossomed each succeeding year on Old Christmas Eve.

grow in any garden soil. Propagation, by seeds sown in spring or summer in the open, or in a frame. Only a few of the known species are in cultivation.

Principal Species and Varieties :—

corniculatum phormiceum,

2', Je., or. red.

— *rubrum*, red.

Fischeri, 2', Je., red.

flavum, 2', Je., yel. (*syn.*

luteum). Var. *fulvum* is

deeper in colour: var.

tricolor is a new form.

squamigerum, yel.,

flowers 1½" across.

GLAUX.

In moist situations near the sea this hardy perennial creeper (*ord.* Primulaceæ) is frequently found flowering during May or June. In gardens it grows best in a moist but very light soil, and can be increased by seeds.

Principal Species and Variety:—
maritima, 2", Jc., pk. *alba*, wh.; usually earlier.

Principal Species and Varieties:—

sinensis, 25', Jc., grn. *triacanthos*, 50', Jy., grn.
(syns. ferox of Desfontaine, horrida, macrantha, and macrosperma).
The chief vars. are *inermis*, *major* (30'), *nana* (12'), and *pendula*.
(syns. Bujoti, monosperma [of gardens], and spinosa). The Honey Locust, or Three Thorned Acacia. (See p. 371.)



Photo—Grosvenor Company, Ltd.

GLEICHENIA RUPESTRIS (see p. 373)

GLEDITSCHIA.

These hardy trees (*ord.* Leguminosæ) are not, with the exception of *triacanthos*, very popular, notwithstanding that they are very ornamental deciduous subjects. They grow to a moderate size in any good garden soil. Propagation, by imported seeds where obtainable, but the choicer varietal forms, are grafted upon *sinensis* or *triacanthos*. Seeds are best sown in early spring, about 1" deep, after a good soaking in tepid water.

Other Species:—

macracantha, 20', Jc., grn. *monosperma* (Walt.), 30', Jy., grn. (*syn. aquatica*).

GLEICHENIA.

About thirty species of handsome and distinct Ferns (*ord.* Filices), with much branching fronds, and thin, wiry, creeping stems. As the fronds continue to grow year after year the plants

Glechoma (see *Nipeta*).

ultimately form dense bushes, but they have a tendency to become very bare at the base.

Propagation.—By spores, sown in gentle heat, in sterilised soil, and kept very close; and by division of the creeping rhizomes in spring. This operation needs to be very carefully performed, as *Gleichenias* resent interference. Short lengths of the younger rhizomes should be selected, each with roots attached, and pegged down upon a compost of peat and sand. They must be kept close for several weeks, until they start into growth.

Soil.—Very sandy peat, with a few pieces of charcoal and sandstone. Loam is unnecessary.

Other Cultural Points.—*Gleichenias* are commonly regarded as being difficult to grow, but if given abundance of water at all times they are not so. The temperature of a warm greenhouse suits most of them. They like plenty of surface room for their creeping rhizomes, and large, shallow pans or tubs are the most suitable receptacles. Continual attention to staking is needed, otherwise the plants become a tangled, unsightly mass. In removing the dead pinnae take care not to cut away the live stems, from which young growths will subsequently start. Insects, with the occasional exception of thrips, are not troublesome.

Principal Species and Varieties :—

- | | |
|---------------------------------------------------|----------------------------------------------------------------------------|
| circinata, 6', warm grh. | — longipinnata, 6', warm grh. |
| — Mendelii, 6', warm grh. | dichotoma, 6', grh. (<i>syns.</i> ferruginea, Hermannii, and rufinervis). |
| — microphylla, 3', warm grh. | flabellata, warm grh., 5'; the most difficult to grow. |
| — semivestita, 6', warm grh. | — rupestris, 5', grh. (<i>see p. 372</i>). |
| — Speluncæ, 3', st. dicarpa, 6', grh. | — gigantea, 6', grh. |
| — alpina, 3', grh. (<i>syns.</i> hecistophylla). | — glaucescens, 5', grh. |
| — glauca, 5', grh. | |

Other Species :—

- | | |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| acutifolia (<i>see</i> quadripartita). | longissima, grh. (<i>syns.</i> Bancroftii and excelsa). |
| Bancroftii (<i>see</i> longissima). | microphylla (<i>see</i> circinata var.). |
| bracteata (<i>see</i> flagellaris). | pectinata, st. |
| cryptocarpa, 3', grh. | pubescens, st. (<i>syns.</i> furcata, Matthewsii, and tomentosa). |
| Cunninghami, grh. | quadrupartita, grh. (<i>syn.</i> acutifolia). |
| excelsa (<i>see</i> longissima). | rufinervis (<i>see</i> dichotoma). |
| ferruginea (<i>see</i> dichotoma). | tomentosa (<i>see</i> pubescens). |
| flagellaris, st. (<i>syns.</i> bifurcata, bracteata, levi-gata, and plumiformis). | |
| furcata (<i>see</i> pubescens). | |

GLOBBA.

Herbaceous perennials (*ord.* Scitamineæ), with showy and curious flowers, of easy culture in a stove. Propagation, by root division in spring. Soil, equal parts of loam and leaf soil, or loam and peat, with sand.

Principal Species :—

- | | |
|-------------------------------------------------------------------|----------------------------------------|
| albo-bracteata, 2½', wh., yel. (<i>syns.</i> alba and coccinea). | some plant, in bloom most of the year. |
| atrosanguinea, 1½', yel., with sc. bracts; a hand- | Schomburgkii, 1', Aug., yel., or red. |
| | sessiliflora, 1½', Aug., yel. |

GLOBULARIA.

Herbs and shrubs (*ord.* Selaginæ), with pretty flowers in heads. Some do well in the rock garden, if given a moist soil and a sheltered nook. The

herbaceous perennials may be increased by seeds sown in a cold frame in spring, or when ripe, or by root division in spring; the greenhouse shrubs by seeds and cuttings.

Principal Species :—

- | | |
|--------------------------------------------|-------------------------------------------------|
| Alypum, 2', Aug., Sep., grh. shr. | vulgaris, 6" to 12", sum., hdy. herbaceous, bl. |
| nudicaulis, 6', sum., hdy. herbaceous, bl. | |

Other Species :—

- | | |
|------------------------------------------------------------------|----------------------------------------------------|
| cordifolia, sum., hdy. sub-shr., bl. | rana, sum., hdy. herbaceous, bl. |
| longifolia, 3', Jy., Aug., grh. shr., wh. (now called salicina). | trichosantha; 6" to 8", sum., hdy. herbaceous, bl. |

GLORIOSA.

Description.—Very handsome bulbous plants (*ord.* Liliaceæ), with long, wiry stems. They are of comparatively easy culture if they are not disturbed frequently at the root, and once established, are amongst the most useful and ornamental of climbers for the roof and pillars of the stove. The flowers last well when cut, and are of considerable service for table decoration.

Propagation.—By seeds, and offsets from the old tubers. Seeds should be placed singly in small pots about the middle of January, and the pots plunged to the rims in brisk bottom heat. Propagation by offsets needs even more care, or the old tubers will receive injury. The offsets may be placed in small pots early in the year, whilst they and the old bulbs are yet dormant, plunged in bottom heat, and treated in much the same way as the seedlings.

Soil.—Two parts of peat, one part of loam, and one of sand, for the seedlings, and equal parts of peat and loam, with about one-sixth of the whole bulk of sharp sand, for the older plants.

Other Cultural Points.—The culture of *Gloriosa* as may be summed up as follows: Stove heat all the year round; plenty of water from the time that growth starts in the spring until it dies down in the autumn; and no water at all, but perfect rest, during the winter. Pot culture is to be recommended because the supply of moisture can then be regulated to a greater nicety. Any repotting that is necessary should be done not later than the end of January. A temperature of 70° is required to set the plants growing briskly. The roots are very tender and brittle.

Principal Species and Varieties :—

- | | |
|------------------------------------------------|---------------------------------------|
| simplex, 4' to 5', sum., flowers than the type | |
| deep or., yel. (<i>syn.</i> virescens). | (<i>syn.</i> Methonica grandiflora). |
| — Plantii, yel., red. | superba, 6' to 9', sum., |
| — grandiflora, larger | rich or., red; the best. |

GLOSSODIA.

Terrestrial Orchids (*ord.* Orchidaceæ), requiring a greenhouse temperature. Propagation, by division of the roots in spring, keeping the divisions in a close frame until they start strongly. Soil, sandy loam and peat in equal parts. *Glossodias* need plenty of water when growing; little or none in the winter.

Principal Species :—

- | | |
|-------------------------------------------------|-------------------------------------------------|
| major, Je., bl. (<i>syn.</i> Caladenia major). | minor, Je., bl. (<i>syn.</i> Caladenia minor). |
|-------------------------------------------------|-------------------------------------------------|

Globe Amaranth (*see* *Tamphrena globosa*).

Globe Flower (*see* *Trollius*).

Globe Thistle (*see* *Erhinops*).

Globulea (*see* *Crassula*).

Glory of the Snow (*see* *Chionodoxa*).

Glory Pea (*see* *Cianthus*).

Glossaspis (*see* *Glossula*).

Glossocoma (*see* *Codonopsis*).

GLOSSULA.

A tuberous rooted Orchid (*ord.* Orchidaceæ), requiring a stove temperature. Propagation, by root division. Answers to the same treatment as the Glossodias, which *see*.

Only Species :—

tentaculata, 9", Dec., grn., curious flowers; the segments resemble the antennæ of an insect.

GLOXINIA.

Description.—An important race of plants (*ord.* Gesneraceæ), with large, handsome, bell-shaped

place in a temperature of 70°, and shade carefully with sheets of paper. Division of the tubers may be practised in spring just as they are beginning to make growth. The divisions should be potted in sandy soil, and kept close in a propagating frame until they start. Leaf cuttings may be employed to increase the stock of any meritorious variety. Stout, healthy leaves should be chosen, and, after removing them with the footstalk intact, they should be dibbled into pans of sandy soil. Or large leaves may be selected, the midrib nicked through in several places with a



A SPECIMEN GLOXINIA FROM SEED.

flowers. Correctly, they belong to the genus *Sinningia*, most of them having been derived from *S. speciosa*, but they are kept distinct here for horticultural purposes.

Propagation.—By seeds, division of the tubers, and leaf cuttings. Seed sowing is by far the best of the three methods. A packet of seed from a good strain may be relied upon to give flowering plants within six months from the date of sowing. Moreover, successional sowings will yield flowers through the greater part of the year. The seed pots or pans should be well drained, and filled to within 1" of the rim with sandy soil. Carefully level this, water, sow the seed thinly on the moist surface, cover each pot or pan with a sheet of glass,

sharp knife, and the leaves pegged down at full length on a bed of sandy soil. In a few weeks "bulbils" will be formed at each nick.

Soil.—Equal parts of loam and leaf soil, with plenty of sand, for the young plants; two-thirds of fibrous loam, one-third of leaf soil or peat, and sand, for the older specimens.

Other Cultural Points.—The first single shift for the seedlings should be into 2½" pots, the next into 4½", then, if they are very strong, into 6". Generally, however, a 4½" pot is large enough. Shade is necessary at all times, for a few minutes of bright sun will hopelessly disfigure all the best leaves. A mean summer temperature of about 65° is a good one, whilst during the winter months the house may stand at about 55° by night. Gloxinias like a fair quantity of water at the roots,

Glottideum (*see* *Sesbania*).

but being fine-rooted subjects they detest a water-logged soil. Plenty of atmospheric moisture there must be, for aridity is a sure forerunner of red spider, which spells ruin. When in flower the plants may, with advantage, be placed in cooler surroundings; the flowers will last the longer.

Old Plants.—Gloxinias may be grown on for a number of years if desired. After flowering, the plants should be given less water, and gradually allowed to go to rest. When quite dormant, the pots should be placed on their sides beneath the greenhouse stage to winter. Growth will probably commence about the beginning of February, if the house has a night temperature of about 45°. As soon as signs of growth are seen, the old soil should be shaken away and the plants potted in light, rich soil, and in small pots; or they may be started in boxes of Cocoanut fibre refuse, and potted when the growths are about $\frac{1}{2}$ " long.

Principal Species and Hybrids (*see also* SINNINGIA):—

diversiflora, a hybrid.	multiflora (<i>see</i> Nægelia multiflora).
gesneroides, a hybrid (Sinningia × Gesnera Donklari).	pallidiflora, 1', Aug., pale bl.
glabrata, 9", Aug., wh. (<i>syn.</i> fimbriata of Botanical Magazine 4430).	speciosa (<i>see</i> Sinningia speciosa). The parent of the modern Gloxinia.
maculata, 2', Je., Oct., pur., bl.	

Named florists' varieties, such as Lord Roberts (*see* figure), are numerous.

GLYCINE.

Stove and greenhouse herbs (*ord.* Leguminosæ). Propagation, by cuttings of the side shoots inserted in spring, under a bell-glass, in gentle heat. Soil, loam and peat in equal parts, with a little sand.

Principal Species :—

hedysaroides, st., Je., pur., branches twining.

GLYCYRRHIZA. (LIQUORICE.)

Hardy, herbaceous perennials (*ord.* Leguminosæ), with pretty flowers. They are, as a rule, rather coarse-growing and straggling. Propagation, by division of the roots in spring or autumn, preferably the former. Each division should have one or two sound buds. Any ordinary garden soil will do.

Principal Species :—

echinata, 3', Je., Jy., pur., plant sticky.	aut., pale bl., yields liquorice.
glabra, 3' to 4', sum.,	lepidota, 2' to 3', Jy., Aug., wh., pods prickly.

GLYPHOSPERMA.

A rare and curious sub-hardy plant (*ord.* Liliacæ), with singularly marked seeds. It is close to the better known genus Anthericum. Propagation, by root division in spring. Palmeri, 2', summer, has white, starry flowers. It should be protected with dry litter in winter. It will do well in a dry, sandy soil.

GMELINA.

Stove evergreen trees (*ord.* Verbenacæ), propagated by cuttings of matured side shoots inserted in bottom heat, in spring. Soil, fibrous loam, with plenty of sharp sand.

Principal Species :—

arborea, 20', Je., Aug., wh. (*syn.* Rheedii).

Glyptostrobus (*see* Taxodium).

GNAPHALIUM. (CUDWEED; EVER-LASTING.)

A large genus (*ord.* Compositæ), comprising annuals, biennials, and perennials from nearly all parts of the earth. Very few of them, however, are of any value to gardeners.

Principal Species :—

decurrens, 2' to 3', Jy., Aug., hdy. per., wh.	margaritaceum (<i>see</i> Anaphalis margaritacea).
Leontopodium (<i>see</i> Leontopodium alpinum).	

GNIDIA.

There are upwards of fifty species in this genus (*ord.* Thymelæacæ) of greenhouse evergreens. Propagation, by cuttings of the young shoots in spring, when they are not more than 2" long, inserted in sand in a close but cool frame. Soil, peat and sand.



Photo: Cassell & Company, Ltd.

GLIXINIA LORD ROBERTS.

Principal Species :—

denudata, 1½', My., Jy., yel.	pinifolia, 1', Mch., Ap., wh.; very fragrant; the best.
oppositifolia, 1', My., Jy., pale yel.	tomentosa, 3' to 4', Mch., Ap., yel.

GOAT MOTH.

The Goat Moth (*Cossus ligniperda*) has the unenviable distinction of producing not only one of the largest but also one of the most destructive of European caterpillars. The perfect insect measures about 3" from point to point of its forewings, which are dull brown in hue, shaded with deeper brown markings. The female moth lays her eggs in crevices in the bark of timber and fruit trees, and the larvæ tunnel their way towards the heart of the tree. The full grown caterpillar will measure as much as 4" in length, and its powerful jaws make light of the hardest wood. Thousands of pounds'

Goat's Beard (*see* Spiræa Aruncus and Trago-pogon).

Goat's Foot (*see* Oxalis caprina).

Goat's Rue (*see* Galega).

worth of timber is ruined annually by the Goat Moth caterpillars.

It is difficult to find remedies, but coating the trees with cow dung and clay, to prevent egg laying; catching and killing the insects when they make their appearance in June and July; injecting sulphur fumes into the holes made by the caterpillars, or searching for the latter with a sharp, hooked wire, have all been practised with some amount of success. In cases of bad infestation there is little for it but to cut down the trees and burn them, caterpillars and all.

GODETIA.

Showy, hardy annuals (*ord.* Onagrarieæ), now referred by botanists to *Oenothera*, but kept distinct here for garden purposes. Propagation, by seeds sown outdoors in March and April, where the plants are to flower, thinning the seedlings until they finally stand not less than 6" apart. For early blooming it is advisable to sow outdoors in September; plants from autumn sowings are almost invariably vigorous and sturdy. Ordinary soil.

A Selection of Varieties:—

Duchess of Albany, wh., dwarf.	Lady Satin Rose, ro., dwarf.
Lady Albemarle, crim., dwarf.	Princess of Wales, ruby, crim., tall.
	The Bride, wh., car., tall.

GODOYA.

Stove trees (*ord.* Ochnaceæ), with thick and leathery leaves. Propagation, by cuttings of matured shoots inserted in sandy soil, in heat, in spring. Soil, loam two parts, leaf soil one part, and plenty of sand.

Principal Species:—

gemmiflora, 20', Je., vel. (now <i>Blastemanthus gemmiflorus</i>).	splendida, 10', wh., fragrant.
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GOETHEA.

Stove evergreen shrubs (*ord.* Malvaceæ), with showy flowers. Propagation, by cuttings in sandy soil in spring, with a little bottom heat. Soil, equal parts of loam and leaf soil, with sand.

Principal Species:—

makoyana, 2', crim. bracts.	multiflora, Sep., red or pk. bracts (<i>syns.</i> <i>Pavonia multiflora</i> and <i>P. Wiotii</i>).
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Other Species:—

semperflorens (now <i>Pavonia semperflorens</i>).	strictiflora, 5', Aug. bracts red, with yellowish marks.
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Good Hybrids:—

The following hybrids are dwarfer and more floriferous than the parents:—

floribunda, 1' (approximate), sum., pk.	intermedia, 1½' (approximate), sum., red.
	kermesina, 1', flowers at all times, pk.

GOLDEN FEATHER.

A popular name for *Pyrethrum parthenifolium aureum*. Golden Feather is a handsome foliage plant, in great request for bedding purposes. It

Godwinia gigas (see *Dracontium gigas*).

Gold Cup (see *Ranunculus bulbosus*).

Golden Chafer (see *Rose Enamies*).

Gold Fern (see *Gymnogramme*).

Golden Chain (see *Loburnum*).

Golden Hair (see *Chrysocoma* and *Aster*).

Golden Rod (see *Solidago*).

Golden Saxifrage (see *Chrysosplenium*).

is naturally compact, and a still better habit may be induced by consistent pinching. When Golden Feather is employed for carpet bedding, as it frequently is, it is necessary to cut over the plants at intervals of about a week or ten days. The seed, which is quite small, should be sown thinly on sandy soil (not covered) in March, in heat. The seed pans should be kept in heat until the seedlings have produced their first rough leaves, when they should be given rather cooler quarters. Pricking out must be attended to at an early stage. Seed may, if desired, be sown out of doors at the beginning of April, but the resulting plants are naturally rather later in filling their positions than those raised in heat under glass.

GOLDILOCKS.

A popular name for *Aster Linosyris* (*syns.* *Chrysocoma Linosyris* and *Linosyris vulgaris*). The name refers to the heads of golden yellow flowers which this plant bears. Sometimes, also, spelt Goldyllocks. (For description, see *ASTER*.)

GOLD THREAD.

A name commonly given to the thin, yellow roots of *Coptis trifolia*, which are largely used in Canada and the United States for dyeing silken and woollen fabrics.

GOMPHIA. (BUTTON FLOWER.)

There are over eighty species in this genus (*ord.* Ochnaceæ), all stove evergreen trees and shrubs. Propagation, by cuttings of the ripened shoots, taken in spring, inserted in sandy soil, and placed in strong bottom heat in a close frame. Soil, two parts of sound loam, one part of peat, and sand.

Principal Species:—

decora, 10' to 15', My., vel.

GOMPHOLOBIUM.

Handsome Australian greenhouse shrubs (*ord.* Leguminosæ), with showy flowers. Although seldom seen outside botanic establishments, they are well worthy of the attention of the general cultivator. Propagation, by cuttings of the young shoots, which should be not more than 2" in length, taken in spring, inserted in sandy peat, and kept close under a bell-glass in an intermediate house. Soil, peat and loam in equal parts, chopped up into small pieces but not sifted, with sand, and a few pieces of charcoal. The greatest care is necessary in watering, as a little inattention means the loss of all the feeding roots, and the death of the plant. Plenty of drainage is the first essential.

Principal Species:—

grandiflorum, 2', Je., vel.	twining (<i>syns.</i> <i>pedunculare</i> , <i>tenuë</i> , and <i>venulosum</i> of <i>Botanical Register</i>).
knightianum, 1' to 2', Aug., pk. or pur. (<i>syn.</i> <i>heterophyllum</i>).	
polymorphum, Mch., Aug., sc., vel., pur.: stems	venustum, 1' to 3', Ap., Jy., pur.

Other Species:—

aciculare (see <i>tomentosum</i>).	heterophyllum (see <i>knightianum</i>).
barbigerum (see <i>latifolium</i>).	latifolium, 1' to 2', Ap., Je., vel. (<i>syn.</i> <i>barbicapitatum</i> , 2', Jy., vel.: probably a var. of <i>tomentosum</i>).
	marginatum, 1', My., vel. minus, My., vel. (<i>syn.</i> <i>Burtonia minor</i>).

Godfussia (see *Strobilanthes*).

Gold Knots (see *Ranunculus Acris*).

pedunculare (see polymorphum).
 tenue (see polymorphum).
 tomentosum, 1' to 3', My., yel. (syns. aciculare and lanatum).
 venulosum (see polymorphum).

GOMPHRENA. (GLOBE AMARANTH.)

This genus (*ord.* Amarantaceæ) comprises nearly seventy species of half-hardy annual or perennial herbs, many of them with large, showy flower heads. They are chiefly represented in gardens by the species *globosa*, which belongs to the so-called Everlasting Flowers, from the property which the flowers have of retaining their colour for a long time after they are cut. The heads should always be cut just before they are fully open, and the stems should be laid down so that they may dry straight. Gomphrenas not only make handsome border plants, but they are of service for cool conservatory decoration, as they take kindly to cultivation in pots. Out of doors, any ordinary garden soil will suit; for pots a mixture of two-thirds of loam, one-third of leaf soil, and sand is suitable. Seed should be sown in March and April in pots or pans of light, well-drained soil, the receptacles being placed in a temperature not lower than 65°. Prick the seedlings out at an early stage, and pot on, first into 2½", then into 4½" pots. The latter size will do for those plants which are to flower under glass.

Principal Species and Varieties:—

globosa, 1½', Jy., ann., colours various. There are many vars.; *nana* is dwarf and compact, *alba*, *aurea superba*, *carnea*, and *purpurea* are all good.

Other Species:—

perennis, 2', Jy., Oct., *pulchella*, 1½', Jy., ann., per., yel., vio.

GONATANTHUS.

Distinct stove perennials (*ord.* Araceæ), closely related to *Colocasia*, and requiring the same cultural treatment as *Caladiums*. Two species only.

Principal Species:—

sarmentosus, My., lvs. pale grn., spathe golden yel., fragrant.

GONGORA.

Stove epiphytal Orchids (*ord.* Orchidaceæ) from tropical America. The flowers are borne in drooping racemes which are not infrequently 2' in length. The plants thus make capital basket subjects, and they take kindly to wooden baskets if not very deep. A compost of fibrous peat and live-sphagnum moss is suitable. Plenty of water must be given during summer, when the plants are making up their growths, but only enough moisture to keep the roots and pseudo-bulbs from shrivelling should be allowed in the winter. The cooler end of the *Cattleya* house is a capital place for them. Propagation, by division of the clumps and, when necessary, of the old pseudo-bulbs. Imported pieces usually do well.

Principal Species:—

atropurpurea, sum., dark pur.
maculata, 1½', yel., spotted red. Many vars.;
grandiflora, pure wh., is one of the best.
portentosa, Ap., flesh pk., spotted pur.

Other Species:—

armeniaca, sum., yel.
bufonia, pur., wh.; close to *atropurpurea*.
speciosa (see *Coryanthes speciosa*).

Gomphostylis candida (see *Calogyne maculata*).

Gonatopus (see *Zamioculcas*).

GOODENIA.

Greenhouse herbs and sub-shrubs, occasionally shrubs (*ord.* Goodenovieæ). Cuttings root quickly if placed in heat in spring. Soil, equal proportions of peat and loam, with plenty of grit. Free drainage.

Principal Species:—

grandiflora, 3' to 4', Jy., stelligera, 1' to 1½', Je., herbaceous, yel., per., yel. A curious ovata, 2' to 4', Jy., shr., yel., plant with almost leafless stems.

GOODIA.

Handsome greenhouse shrubs (*ord.* Leguminosæ) from Australia. The flowers are small and Pea-shaped. Propagation, by seeds, of which healthy plants ripen plenty, sown in spring. Cuttings of the young shoots root in spring if dibbled in pure sand under a bell-glass in gentle heat. Soil, two-thirds peat and one-third loam, with plenty of sand.

Only Species:—

lotifolia, 2' to 4', Ap. to pubescens, 1' to 3', sum., Jy., grh., yel., red. grh., yel., spotted red.

GOOD KING HENRY.

A popular name for *Chenopodium Bonus-Henricus* (*ord.* Chenopodiaceæ). The leaves are cooked as a substitute for Spinach, and the young, succulent stems in the place of Asparagus, which they somewhat resemble in flavour. Seed should be sown in drills 1' apart, on well-worked land, from the beginning to the middle of April. The seedlings should be thinned until they stand from 6" to 9" apart. A few of the leaves may be picked the first year, but not enough to weaken the plants, or the crop of young shoots in the following spring will be reduced. These stems are produced about the same time as Asparagus in the open ground.

GOODYERA.

Description.—Hardy, greenhouse, and stove terrestrial Orchids (*ord.* Orchidaceæ), with thick, fleshy, tuberous roots, and with the flower spikes borne in the middle of the clusters of leaves. Some of the species have very handsome foliage, the markings resembling those seen in many of the *Anæctochilus*. They are, however, not very generally grown.

Propagation.—By cuttings of the young shoots, each shoot having a small portion of the tuberous root attached, placed under a bell-glass, and kept close. Cuttings of the hardy species will root in an ordinary cold frame, but the stove species require a close propagating frame and bottom heat.

Soil.—This should largely consist of peat. Very little loam is needed. A few pieces of sandstone of the size of Hazel nuts are an improvement.

Other Cultural Points.—Small pans or shallow pots are the best receptacles, and these should be kept close up to the glass. Plenty of water must be given all through the growing season; little or none in the winter, when perfect rest is desirable. For the hardy forms a shady, sheltered nook in the rockery should be chosen.

Principal Species, Hybrid, and Variety:—

discolor, 10", win., grh., *Dominii*, st., lvs. larger wh., lvs. dark grn., than in *discolor*; hybrid, striped wh. (now *Hæmaria discolor*).
pubescens, 3", Jy., hdy., wh., lvs. grn., veined

Goniophlebium (see *Polypodium*).

Goniopteris (see *Polypodium*).



Photo: Cassell & Company, Ltd.

GOOSEBERRY LANGLEY BEAUTY (see p. 379).

silver. Minor is a pretty var. that is even smaller.

velutina, grh., wh., flushed ro., lvs. pur. grn. with a wh. mid-rib.

Other Species :—

cordata, Sep., st., yel., br.

(syn. *Georchis cordata*).

macrantha, Je., grh.,

nearly hdy., ro. (syn.

picta).

Menziesii, grh., greenish

wh., lvs. variegated.

repens, 6", hdy. ev., wh.

rubicunda, Jy., st., red.

Veitchii, st., lvs. red br.,

ribbed wh.; a hybrid

(discolor \times *Anocto-*

chilus Veitchii).

GOOSEBERRY.

Blessed, as it is, with a constitution that enables it to defy even the most unsuitable conditions, the Gooseberry (*Ribes Grossularia*) will thrive on most soils and in most situations. It likes best of all a fairly deep and fertile loam of medium texture, with free drainage, and given this, with careful pruning, it will bear enormous crops.

Methods of Training.—The bush tree, with a clean stem of about 6" above the ground, and a more or less spherical head from 3' to 6' in diameter, is the favourite method of training. These bushes may be planted from 4' to 5' apart each way. If regularly pruned they produce plenty of fruit. The best fruit, however, is borne upon the trained and cordon trees which are so useful for fences and walls. On these the fruit not only ripens better and is of superior flavour, but it can be gathered much more easily. Cordon Gooseberries planted against a north wall will carry their fruit until well into November if covered with mats.

Pruning.—With the ordinary bush the first thing to do is to cut out old and worn out wood that is not wanted as a framework for the young. Any suckers that may be observed in the centre should follow. Then the young shoots should be thinned, the weak and spindly ones being sacrificed first, until the remaining ones have at least 3" or 4" of clear space between them. Finally, the weak, unripe tips should be clipped off. With cordon trees the spur system is practised. The young growths are spurred back to within a few buds of their origin, and if these growths have been summer pruned, *i.e.* pinched at the fifth or sixth leaf in July, the basal buds should be chiefly fruit buds. The leaders of each cordon or main branch may be cut back to within two or three buds.

Standards are obtained by working stocks with clean stems, 4' or 5' high. The pruning may be as for the bush tree, except that more may be clipped from the tips of the growths left.

Propagation.—By cuttings of clean, well-ripened young wood, taken off 12" to 14" in length. All the buds save three or four at the top should be carefully picked out with the point of a sharp knife, or they will cause trouble in the way of suckers afterwards. Plant the cuttings in rows, 6" apart each way, let them be at least 6" deep in the soil, and make the latter very firm about them. A year afterwards they may be lifted and transplanted to nursery beds.

Planting.—From the middle to the end of October is the best time of the year to plant Gooseberries, as the warmth remaining in the soil assists the formation of new roots; the plants winter correspondingly well, and start more briskly in the spring. But planting may be done at any time, weather permitting, from October to March, inclusive.

Goora Nut (see *Cola acuminata*).

Enemies :—

Gooseberry Sawfly.—The Gooseberry Sawfly (*Nematus Ribesii*) is the most troublesome insect enemy of the Gooseberry, and not infrequently some of the damage that is laid to the charge of the Magpie Moth, in the way of defoliated bushes, is really its work. The flies are on the move early in spring, and lay their eggs upon the under sides of the newly opened leaves. The eggs soon hatch, and the caterpillars commence at once to feed, and do so almost continuously until they are full-grown. The chrysalis stage and the winter are passed in the soil beneath the tree.

The removal of the surface layer of soil or mulching, and its purification by fire, will get rid of many chrysalides, and this is to be recommended in all cases where bad attacks are experienced. Tobacco powder, or dry soot and air-slaked lime in equal parts, mixed, dusted over the bushes, make them distasteful to the flies, and a dressing of either lime or soot (not the two together) forked into the ground in autumn is helpful. White Hellebore powder dredged over the trees whilst the leaves are damp from dew or rain will kill the caterpillars that it touches. For a liquid spray a solution of Calvert's Carbolic Soap is effective.

The Magpie Moth.—*Abraxas grossulariata* is called the Magpie Moth owing to its colour: the wings are white with black spots, which are especially numerous on the fore-wings.

The caterpillar of this moth, the well-known Gooseberry Caterpillar, belongs to the family of Geometridæ or Loopers. It is very destructive of the foliage of Gooseberries. The perfect insects are on the wing from June to August, the caterpillars hatch from the egg in about twelve days, and at once begin to feed. When full-fed they are about 1" in length; they are white with black spots upon the back. Hand-picking may be resorted to where only a small number of bushes are concerned. Spraying with a mixture of 1 lb. of soft soap and 1 lb. of quassia chips boiled in 4 gallons of soft water is good. Dusting with Hellebore powder is also efficacious, or a dressing of soot or lime may be applied in autumn after the leaves have fallen, and again in spring.

Gooseberry Fungi.—There are several Fungi that find a home upon the Gooseberry. They include the familiar Cluster Cups (*Puccinia pringsheimiana*), Mildew, *Plowrightia ribesia*, and a relative of the Tinder Fungus (*Fomes fomentarius*). The first named is not only the commonest but the most destructive. The orange coloured Cluster Cups, which are the fruits of the fungus, with their contained myriads of spores, make their appearance in spring. Spraying with Bordeaux Mixture is efficacious, and it is advisable to destroy all the Sedges, or species of *Carex*, in the neighbourhood. One of the links in the life cycle of the fungus will thus be broken, for during a part of its career it lives upon the Sedges. With Mildew all Gooseberry growers are well acquainted. Fortunately it is not difficult to deal with, but soon yields to repeated dustings with flowers of sulphur.

The Wound Fungus (*Plowrightia ribesia*) attacks Red, White, and Black Currants as well as Gooseberries. It forms large, black warts or cysts upon the branches, which ultimately break into wounds. Spraying with potassium sulphide, and dressing the excrescences with Stockholm tar are to be recommended.

Gooseberry Mite.—Troublesome little pests (*Bryobia pretiosa*) that are frequently mistaken for red spider. They work in a similar way, and produce much the same results upon the foliage. Like spiders, too, they are most numerous in dry seasons. Ivy upon walls has been charged with being a breeding ground for the *Bryobia*, and this is doubtless to some extent true. Spraying with kerosene emulsion is a safe and sure remedy, for the mites abhor paraffin in any shape or form.

Gooseberry Scale.—*Lecanium Ribis*, the Gooseberry Scale, is not at present a common pest, but it is increasing in numbers. There are two broods of the pest each season, the eggs of the late brood not hatching until the following spring. The best time to deal with Scale is when the larvae are moving. At that time kerosene emulsion, freely diluted, may be sprayed over the trees so as to thoroughly wet every part. Water at a temperature of 132° is also efficacious. When, however, the Scale has settled down into the familiar little excrescences sterner measures are needed, and scrubbing with a hard brush is the only thing that will get rid of them. For Gooseberries this is, of course, impracticable.

A Selection of Varieties :—

Crown Bob, bright red.	Levellor, grn., yel., heavy cropper.
Dan's Mistake, light red, large, hairy.	Pitmaston Greengage, small, grn., fine flavour.
Drill, grn., yel., large.	Red Warrington, red, medium, hairy, good for main and late crops (<i>syn. Rough Red</i>).
Early Sulphur, small, yel., hairy, early.	Whinham's Industry, red, one of the best.
Green London, grn.	Whitesmith, wh., hairy, large.
Ironmonger, dark red, medium, hairy.	
Langley Beauty, dark yel., excellent flavour (<i>see p. 378</i>).	

For Exhibition :—

Dan's Mistake.	London, dark red.
Drill.	Thumper, grn.

For Gathering Green :—

Berry's Early Kent.	Whinham's Industry.
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GORDONIA.

A small genus of evergreen trees (*ord. Ternstroemiaceæ*), some of which bear showy flowers. Few are cultivated. Propagation, by layers and by seeds. Soil, peat and sand, or leaf mould and sand, with a little loam. The hardy species are the most valuable.

Principal Species :—

<i>anomala</i> , 3', Nov., grh., cream yel. (<i>syn. Polyspora axillaris</i> of <i>Botanical Magazine</i> 4019).	<i>Lasianthus</i> , 8' to 10', Jy., Aug., grh., wh., large, fragrant.
<i>grandis</i> , st. or grh., wh.	<i>pubescens</i> , 4' to 6', Aug., grh., wh., fragrant.

GORSE (see ULEX).**GOSSYPIMUM.**

A small genus (*ord. Malvacæ*) of tropical, perennial herbs or shrubs, of no value to decorative horticulture, but of the first importance economically, since they supply the cotton of commerce. Propagation, by seeds, which in this country should be sown singly in small pots, while the seedlings must be repotted before they become pot-bound. A light, rich soil, such as a mixture of loam, leaf soil, and old Mushroom bed manure rubbed through a $\frac{3}{4}$ " sieve, and plenty of heat and moisture, are indispensable. As the authenticated

Goosefoot (see Chenopodium).

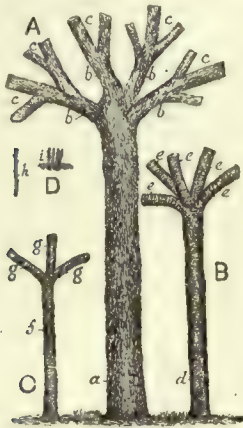
use of cotton dates back for over 2,600 years, it follows that Cotton plants have long been in cultivation, probably much longer than the time suggested. Barbados, herbaceous, and arboreum are the principal cotton producers. Barbados gives the Sea Island Cotton. There are many varieties.

Principal Species and Varieties :—

arboreum, Jy., wh. and Hibiscus esculentus.
Bahma. An erect, nearly branchless plant. Probably a hybrid between herbaceous, 5', Sep., yel.
The Egyptian Cotton herbaceous, 3' to 4', Jy., yel. (*syn. indicum*).

GOUANIA.

Stove climbing shrubs (*ord. Rhamnæ*) of little value horticulturally. Cuttings root quickly if taken in spring, inserted in sand, plunged in bottom heat in a propagator, and kept close for three or four weeks. Soil, loam and peat in equal parts, with sand. The Chaw-Stick of Jamaica (*domingensis*) is the only species of note.



PREPARING TREES FOR GRAFTING.

A, standard tree headed for grafting: a, stem; b, main limbs; c, branches. B, three-quarter standard headed: d, stem; e, main limbs or branches. C, half standard: f, stem; g, branches. D, the scions or grafts: h, scion cut from the tree; i, scions inserted in the soil to wait till grafting time. (See p. 381.)

GOURD.

The word "Gourd" is usually employed as meaning only the more or less ornamental fruits which are seen at various horticultural shows throughout the country. Strictly, it includes all the members of the Cucurbitaceæ, to which belong the Vegetable Marrow (*Cucurbita Pepo ovifera*), the Melon (*Cucumis Melo*), and the Cucumber (*C. sativus*). These are treated under their respective headings. They do not, however, exhaust the list of edible Gourds, for both in France and America many varieties are cultivated for food, although they do not find favour in this country. Most of these edible Gourds belong to three species of the genus *Cucurbita*, viz. *maxima*, *moschata*, and *Pepo*. To the first species belong all varieties having cylindrical, unfurrowed stalks and large, broad leaves, such as the Turk's Cap Gourds; to *moschata* belong the species and varieties with channelled stalks and much lobed leaves; whilst the Vegetable (Long and Custard) Marrow may be taken as the type of the third section.

All the plants are annuals, and if given favourable treatment are remarkable for their quickness of growth. Many may be grown out of doors in the summer, and if trained over trellises or up walls, or over rustic tree stumps, as in the Herbaceous Ground at Kew, make very effective features of the summer garden. Others, such as the Lagenarias and Luffas, have to be cultivated in stove heat, and visitors to the Water Lily House at Kew know how interesting and effective they can be when trained to the roof, the quaintly shaped fruits being allowed to hang down.

Gourds are easy to grow. They need a light, rich soil, such as that furnished by equal parts of fibrous loam and leaf soil, with sand, and plenty of heat in the earliest stages. This applies as well to those that are destined to be planted outdoors as to those which it is intended to grow under glass. Plenty of water is needed at all times from the time the seedling makes its appearance, until the time when the haulm begins to die down. Liquid manure is helpful, and necessary where the plants are heavily cropped. Planting outdoors should not be attempted before the end of May, and as a few degrees of frost would be fatal to the plants it is well to be prepared with protective material for at least a fortnight after that date should the nights be cold.

A Selection :—

Boulogne Grey, large, rind grn., lined grey, flesh yel., edible.	Large Yellow, very large, has been grown to 200 lb. weight, edible.
Chestnut Gourd, medium to small, rind brick red, flesh yel., sugary, edible.	Ohio Squash, a good keeper, edible.
Egg-shaped Gourd, large, skin hard, red, trailer.	Red Etampes, medium, ribbed, or. yel., a favourite with Parisian gardeners, edible.
Embroidered Warty, small, yel., warted, ornamental.	Summer Crookneck, small, yel., warted, ornamental.
Hubbard Squash, grn., flesh yel., floury and sugary, a good keeper, edible, much cultivated in the United States.	Turk's Cap, grn., marbled wh. and yel., ornamental (<i>syn. Turban Pumpkin</i>).
	Yokohama Gourd, ribbed, blk., grn.

GOVENIA.

Terrestrial Orchids (*ord. Orchidaceæ*) requiring a stove temperature. Very few of them are in cultivation. Propagation, by dividing the roots just before they start into growth in spring. The divisions should be started in a close propagating frame, but as soon as they have made a little growth they may be removed to a shelf near the glass in the Cattleya house. Soil, loam and leaf mould in equal parts, with sand. Free drainage is essential.

Principal Species :—

Gardneri, 2', wh.

Other Species :—

Andrieuxii, yel., spotted pur., red.	deliciosa, wh., spotted bt utriculata, 1½', Sep., wh.
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GRAFT.

A graft is a shoot taken from a plant whose good qualities it is desired to perpetuate, or one which for various reasons is not altogether a success on its own roots. The graft, or scion, will subsequently become the leafy, flowering, and fruitful portion of the plant, growing upon the stem and roots of another, but nearly related, subject.

GRAFTING.

There are many recognised forms of grafting, the commonest being (1) tongue or whip, (2) wedge, (3) cleft, (4) crown or rind, (5) notch, (6) saddle.

Time of Grafting.—The actual time of carrying out the work is governed by the locality and the season. When the buds of trees are seen to be swelling freely in spring, the time for grafting has arrived.

Preparing for Grafting.—Preparations for grafting must be made some time beforehand, as with most subjects it is inadvisable to head back the stock when the movement of sap is becoming active. Cut back to within a short distance of the point at which union is to be made, in February, but not when the weather is frosty. The grafts or scions should be of the previous season's wood, well ripened and well furnished with growth buds. They are usually secured during the first two months of the year when the weather is not frosty, and are then laid in beneath a hedge or north wall, where they will continue plump, but will not be excited into growth. Success in grafting largely depends on having the sap moving freely in the stock while that of the graft ("scion") is dormant at the moment of insertion. All the tools required, such as the pruning saw, knives, tying material, wooden mallet, chisel, and a hard wood wedge, should be prepared ready for immediate use. The knives used should be very sharp, so that the wounds may be clean.

Forming a Union.—The crucial point in the actual operation is to ensure the union of the cambium layer, or ring of growing tissue, of both stock and scion. A union on one side is absolutely essential. This having been effected, the tying and claying, or waxing, remain. The clay should be in a very pliable state, so as to be thoroughly worked all over and round the union, for the complete exclusion of air. In the use of wax the material is painted on with a brush, a thin coating being sufficient. In either case should cracks appear they should be promptly filled, so that air may not reach the junction until the union is complete.

Tongue or Whip Grafting.—For working young stocks this is the most useful method. The tops should be removed from the stocks in a row, then the scion prepared by making a long, slanting cut, which removes the basal portion and leaves five buds. Next make an upward cut in the stock to correspond with that on the scion. Make a slanting cut downwards and inwards in the stock and then with a second cut take out a very small wedge. On the scion make two corresponding cuts, measuring to make sure that the size of the stock is reproduced in the scion. Trim carefully if necessary to favour a perfect fit. The scion should then be inserted, making absolutely certain of a union of the inner bark on at least one side, and tie in very firmly. The binding should commence in the middle, pass downwards, and then upwards to finish at the top. Waxing or claying can then be done, and the work will be complete. The number of buds retained on the graft should not exceed four, and if the graft be weak two or three will be better. This method is usually employed for filling up blanks in trained trees.

Wedge Grafting.—For wedge grafting, stock and scion should be about of one size. The graft is cut

so as to form a long wedge at the basal end, and a piece to correspond is cut from the stock. Putting in position, tying and claying, follow.

Saddle Grafting.—The stock is cut to form a wedge, and a wedge-shaped piece is taken out of the scion, thus exactly reversing the processes of wedge grafting.

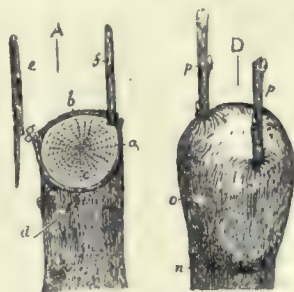
Cleft Grafting.—The old stocks are split across with the chisel; the part is held open with the hard wood wedge; the scions are sliced down and inserted. They must be carefully placed in position, and the wedge removed. Care must be taken to ensure the union of the inner barks. The tying and waxing are the same as in the previous processes.

Crown Grafting.—The scion is cut the same as in the initial stage of whip grafting, but the heel at the upper part is larger. A slit is cut down the bark of the stock, and a bone pressed down to raise the bark and form a cavity for the reception of the scion, which is inserted and made firm in the ordinary way.

Notch Grafting.—A wedge-shaped piece is cut out of the stock, and the scion is cut to fit. Particular care must be taken to secure equal cuts, or it will be found impossible to effect a proper union.

Grafting Clay.—This is used where a quantity of grafts have to be inserted upon the stumps of old trees that have been headed down. The disadvantage lies in the liability to cracking, which must be watched for and guarded against. It is commonly made up with adhesive loam and fresh cow manure in about equal portions, the whole being worked until they are thoroughly incorporated. If preferred, horse droppings rubbed through a sieve, or chopped hay, may be added. The material should have the consistency of soft soap.

Grafting Wax.—This is greatly in favour with many grafters. If only a small quantity is required, it is best to procure a tin of the French



CROWN GRAFTING.

A, portion of stock; a, head cut smoothly; b, bark; c, wood; d, slit through bark; e, scion; f, scion inserted; g, opening ready for second scion. D: n, stock; o, clay; p, scions.

preparation known as mastic L'homme Lefort. It is reliable and easily procured. If larger quantities are wanted, it can be made up without much trouble.

A Wax, to be used warm.—Resin, eight parts; tallow, three parts; Burgundy pitch, one part; and red ochre, three parts. Melt the resin in an iron pot, add the tallow and then the ochre.

GRAMMANGIS.

A small genus (two species) of stove epiphytal Orchids (*ord.* Orchidaceæ). They may be grown in baskets or rafts suspended from the roof. For large plants a compost of live sphagnum moss, fibrous peat, and crocks is needed. Plenty of light at all times, and abundance of water as long as the roots are active, are essentials to success.

Principal Species :—

Ellisii, pseudo-bulbs 6" long, square, sum., yel., wh. (*syn.* *Grammatophyllum Ellisii* of *Botanical Magazine* 5179). *Huttonii*, Je., chocolate br. (now *Cymbidium Huttonii*, under which name it has been figured in *Botanical Magazine* 5676).

GRAMMANTHES (*syn.* *VANANTHES*).

This genus (*ord.* Crassulaceæ) contains one species only—*gentianoides*, 4' to 6", flowering in July, yellow and red (*syn.* *chloræflora*), a pretty half-hardy annual, and its variety *cæsia*, which has smaller, duller flowers than the species. Both plants may be easily raised from seed sown in gentle heat in spring. A light, rich soil is needed,

sand, and a few pieces of charcoal may be added. Good drainage and an abundant supply of water in the growing season, with a rest after growth has been made, are the chief features of the cultivation of *Grammatophyllums*.

Principal Species and Varieties :—

Ellisii (*see* *Grammangis Ellisii*). *fenzlianum*, 4', sum., yel., spotted br. *multiflorum*, 2', sum., grn., br., pur. — *tigrinum*, 2', sum., yel., spotted pur. *rumphianum*, 4' to 6', Je., grn., chocolate, pur. (*measuresianum* and *Gulielmi* II. are now regarded as forms of this). *speciosum*, 9' to 10', win., lvs. 1½' to 2' long, flowers golden yel., spotted pur., nearly 6" across.

GRANADILLA.

A popular name for *Passiflora quadrangularis* and *P. edulis*, which *see*. Also a West Indian name for the edible fruits of that species, which are largely cultivated in the Tropics, and are much esteemed. The fruits of other species of *Passiflora* are likewise spoken of as *Granadilla*, and this use

GRAPE MUSCAT OF ALEXANDRIA (*see* p. 385).

and if a sheltered nook in the rockery can be given, so much the better.

GRAMMATOCARPUS (*syn.* *SCYPHANTHUS*).

Two species only (*ord.* Loasææ). *Volubilis*, summer, yellow, is a half-hardy, twining herb of annual duration. It may be raised from seeds sown in heat in spring. The seedlings may be planted out in a sunny spot at the end of May. Any ordinary garden soil will suit; and frequent doses of liquid farmyard manure when the plants are in the full vigour of growth will improve the colour and quantity of the flowers.

GRAMMATOPHYLLUM.

A small genus of stove epiphytal Orchids (*ord.* Orchidaceæ), including some of the largest of known species. Some are, however, very shy, and to this is doubtless due the fact that they are rare in cultivation. They may be increased by divisions of the pseudo-bulbs. The bulk of the compost should consist of fibrous peat, live-sphagnum-moss, with

of the name is the commonest. The *Granadilla* is occasionally seen in our markets.

GRAPE HYACINTH (*see* *MUSCARI*).
GRAPES.

The fruits of *Vitis vinifera*, which were grown for many centuries in Egypt, and thence gradually disseminated throughout Asia, were probably brought to England by the Romans, and certainly existed during the times of the Normans, from accounts in "Domesday Book." The ripe fruit is very refreshing and easily digested. Enormous quantities are annually imported, but they are often sold only partly ripe, and contain much moisture, but little sugar. The fruit is vastly inferior to home-grown produce.

Given an intelligent system of forcing, and a fair number of adequately heated houses, it is comparatively easy to keep up a supply of Grapes during the whole of the year. The earliest crop—generally pot Vines—is started at the beginning of November, and the fruit is ripe about the second week in the following April. From late autumn

Grains of Paradise (*see* *Anonum*).

Grammitis (*see* *Gymnogramme* and *Polypodium*).

until April the supply is kept up by long-keeping late varieties, for which *see* lists. The fruit is kept in bottles of water in a dark room, with an even temperature of about 45°. No attention is needed beyond occasionally airing the room, cutting out bad berries, and keeping the bottles replenished with water. Soft water only should be used, and a small piece of charcoal should be placed in each bottle.

Vineries.—Houses of almost any shape and structure will grow Grapes successfully, but special conditions apply to houses from which early crops are expected. It will be well to make three sections with regard to time of ripening, viz. early, main, and late crops, and houses suitable to bear the one will not always produce the other. For an early crop a lean-to structure is the best, with a south or south-eastern aspect, and a roof which makes an angle of not less than 45° with its supporting walls. A greater angle is frequently seen, but the temperature of such houses is apt to rise rapidly under sun heat, and scorching of the foliage often follows. Hip-roofed or three-quarter span-roofed houses are also suitable. The borders of an early house should always be inside. For main crops, almost any style of house will do. Span-roofed Vineries are frequently seen, and the curvilinear form occasionally. Such houses are spacious, give the maximum of light and air, and Vines can be trained up both sides, if they run north and south. The fruit usually colours well, but in cold weather it is sometimes difficult to avoid draughts and mildew. The border may be inside or outside, according to circumstances; good results may be obtained in either case. For Muscats, and late varieties generally, the span and three-quarter span are best, and the border should be inside if possible. Muscats not only need more heat to develop their peculiar flavour, but they need a long season of growth, and sometimes autumn is well advanced before ripening is completed. The wires, which should be of stout galvanised iron, may run parallel with the direction of the house, or at right angles to it. They must be not less than 18" from the glass.

Heating.—All vineries should be efficiently heated with hot water. The amount of piping will, of course, depend upon whether it is an early, mid-season, or late house. Fairly good Grapes can be grown in unheated houses, but the quality is not to be compared to that of fruit from heated structures, and in cold, damp seasons mildew and damp are very troublesome.

Ground vineries are miniature houses that usually do well, although unheated, if placed in a sunny position. They may have a height of about 2' 6" to 3' from the ground line, may be about 3' wide, and of any length, according to the number of Vines that have to be accommodated. One rod only must be trained along, about 1' from the ground level, and in the centre of the frame, for such it really is. The pruning and subsequent management of the Vines in ground vineries does not differ from that accorded to those in larger houses.

Borders fall naturally into two sections—inside and outside. A compromise between the two systems is frequently seen, part of the border being outside and part inside. In these cases the house is built upon arches, which allow the passage of the roots to the outer border. For early crops, the borders should be inside, as it is manifest

that it is not conducive to success to have the stems and leaves of the Vines in heat, and the roots working in cold, often very wet, soil. In winter time outside borders should be protected by a covering of boards, or galvanised iron sheets, from heavy rain- or snow-fall. The Vine is naturally a free-rooting plant, and the roots will, if not prevented, travel long distances in search of food and water. They thus often run into cold and uncongenial subsoils, and shanking, mildew, and other evils result. It is well, therefore, that the area of the border should be circumscribed, and the roots kept within the control of the cultivator. It is desirable in clayey soils that the bottom of the bed or border should be paved or concreted. It should have a gentle slope downwards and outwards, and drains should be attached at the lowest point to carry off surplus water. The actual width of the border may vary according to the desire of the owner, but it should not be less than the width of the house. Thus a house 16' wide should have a border 16' wide, and so on. A good medium depth is 3', of which 9" is composed of drainage, and the remainder of soil. Shallow borders are too hot and dry, if not kept constantly watered, and deep borders are apt to be cold after the soil has in a measure become exhausted.

Soil.—In making up a new border the soil should be full of food, but no rank dung should be included. The bulk should be sound, fibrous loam, the top spit from a mellow pasture. This should be chopped up roughly with the spade. To 5 cubic yards of this add 1 yard of old lime rubble, 2 cwt. of $\frac{1}{2}$ " bones, and about $\frac{1}{2}$ bushel of charcoal. The whole should be mixed some months prior to use, and stored under cover until it is wanted. In making up the border, place a layer of freshly cut turves grass side downwards over the 9" of brickbats which constitute the drainage, and fill up with the soil. Instead of making up the whole of the border at once, it is a capital plan, where young Vines are concerned, to do it in several stages. Thus, if the bed is 12' wide, 6' may be made up to plant the Vines in, and 2' may be added each year afterwards until the whole is completed. The virtue of this method is that the soil does not lie long unoccupied with roots, and thus has no chance to become sour. Most cultivators know from experience how quickly a border in whose soil crushed bones are present becomes sour under repeated waterings, unless it be occupied with feeding roots. Four-inch diameter drain pipes communicating with the drainage, and their open mouths standing a few inches above the level of the bed, help to keep the drainage and soil sweet and well aerated.

Propagation.—By eyes, cuttings, layers, budding, grafting, and seeds. The first-named method is the one generally adopted. Eyes are the plump buds borne by the ripened growth of the previous season. To prepare them for insertion they are cut off with about 1" of wood attached, generally towards the end of January or the beginning of February. Shallow pots or pans are drained well, and filled with soil. One eye is placed in a 3" pot or a number in the pans, and buried so that the bud just peeps above the surface of the soil, and points upwards. The pots and pans should be plunged in a bed of Coconut fibre refuse or fermenting material having a temperature of not less than 80°, and the temperature of the house should be from 65° to 70°. Watering must be care-

fully done, or the eyes damp off. As the roots of the young plants reach the sides of the pots they are shifted, being potted freely and given rich soil. A fruiting cane is obtained in two years, but for permanent planting three year-old canes are better. Propagation by cuttings is a common method upon the Continent, and is sometimes practised here. Layers root readily, but eyes produce good plants with such certainty that layers are not needed. Budding is occasionally used to produce a new rod low down on a cane, where a natural break cannot be had. Grafting is by the method known as inarching. Its value is to give a weak growing variety, but one whose fruit is of good flavour, a more vigorous root system than its own. Seeds are only employed to raise new varieties.

Planting.—Vines may be planted at any time provided they are growing in pots, but the best time is when the canes are dormant, or approaching that stage. Do not bury the roots deeply, but spread them out thinly at their natural level, and work fine soil gently in among them. Four feet apart is a good distance to plant.

Methods of Training.—Two systems only are in vogue—the spur, and the extension or long rod. Of these the spur system is the more generally

Cultural Routine under Glass.—A temperature (night) of 45°, rising to 50°–55° by day, is suitable at starting time. This should be raised gradually 1° or 2° per week until it is 60° by night when the Vines are in flower. The summer night temperature should not be less than 60° to 65°, and 70° for Muscats, with a corresponding rise by day. For early crops the rods should be untied from their fastenings and bent down, to ensure equal breaking into growth up the stem. Syringing should be performed regularly twice a day until the Vines are in leaf, when it may be discontinued. Disbudding, or the removal of surplus shoots, should be done gradually until only the requisite number of shoots is left. Tying down the shoots to the wires is a delicate operation. Pressure must be put on very gradually, or the overstrained shoot will snap out from the spur, leaving the latter "blind." Shaking the stems at midday is generally sufficient to ensure setting of the berries, but with shy-setting varieties, like Lady Downe's, a rabbit's tail mounted on a Bamboo should be passed lightly over the bunches. Pollen from another variety may be used if desired. Thinning is an operation that needs considerable care. First of all the small berries inside the bunch should be taken out,



Photo: Cassell & Company, Ltd

HOW TO SET UP GRAPES FOR EXHIBITION.

practised. It consists in spurring back the growth made each season to one or two buds. The main rod is thus a permanency, new laterals being thrown out every year. A young Vine when first planted may be cut back to within three or four eyes of the ground, and one of the resulting shoots taken up to form the rod or cane, the others being rubbed out; or a shoot may be selected at the required height from the uncut cane, taken up, and the others rubbed out. The following winter this young rod is cut back to within 5' or 6' of its origin, and all laterals are spurred to one bud. The next year the topmost shoot is taken on as leader, to be pruned back the following winter as before, the laterals also being treated as in the first year. This goes on until the limit of space has been reached, when the leader is spurred back closely each year in the same way as the laterals. All laterals should be trained in at right angles to the main stem, except in the case of weakly shoots, which may form, with the main cane, an angle of about 45°. Enough shoots should be laid in to cover the space nicely. As a rule, when the spurs are thickly placed, one shoot from a spur is enough, but occasionally two shoots are required. All laterals should be stopped at the second or third joint beyond the bunch, and side shoots from them (sub-laterals) at the first leaf. Under the extension or long rod system young rods are trained in to form the bearing shoots, the old ones being cut out. This treatment is suitable for some varieties, especially Barbarossa.

then the outer ones should be thinned, until they finally stand about $\frac{3}{4}$ " to 1" apart. In the case of Muscats whose bunches have distinct "shoulders," these shoulders should be supported with strings tied to wires. Vines in bearing need plenty of water, and liquid manure frequently. Sewage is good, but it should not be strong, or given on hot days, or the foliage will burn. Thomson's Vine manure is a capital chemical fertiliser. Bone meal is also excellent applied at the rate of 3 oz. to the square yard, pricked in with a fork, and watered in. Frequently damp the house down until the Grapes show colour, then discontinue. Ventilate freely at all times, but never so as to cause draughts. Ripen the wood off thoroughly, by fire heat if necessary, and by plenty of air day and night. Only just keep the frost out of the house during the winter.

Pot Vines.—These are subject to the same general rules as those planted out. Twelve-inch pots are needed, and often a collar to hold supplementary top-dressings is required. Pot firmly, and let the soil be rich and good. A Melon pit is a capital forcing house for pot Vines. The brick beds may be filled with fermenting material, and the pots stood on it or plunged to the rims. The roots will then work through the holes in the pots and find sustenance in the decaying matter beneath.

Culture Outdoors.—As a rule, outdoor Vines do not need so much disbudding, and the rods may be

closer together than those under glass. Pruning is the same. Shelter may be required in winter in exposed situations.

Maladies and Insect Pests.—Many insects attack the Vine. Mealy bug is especially troublesome if allowed to gain a foothold. To keep it out, wash the canes in winter with a strong solution of Gishurst Compound. A little of the loose bark may be removed, but barking, as frequently

in the house; it attracts wasps. Small birds sometimes like Grapes, but the netting will keep them out. For light attacks of mildew, dust with flowers of sulphur; for bad attacks, paint the pipes with the sulphur made into a paste with water, get the pipes hot, and shut the house up. The sulphur fumes kill the mildew spores, but the remedy is a drastic one, and only to be used as a last resource. Avoid cold draughts. Cracking is

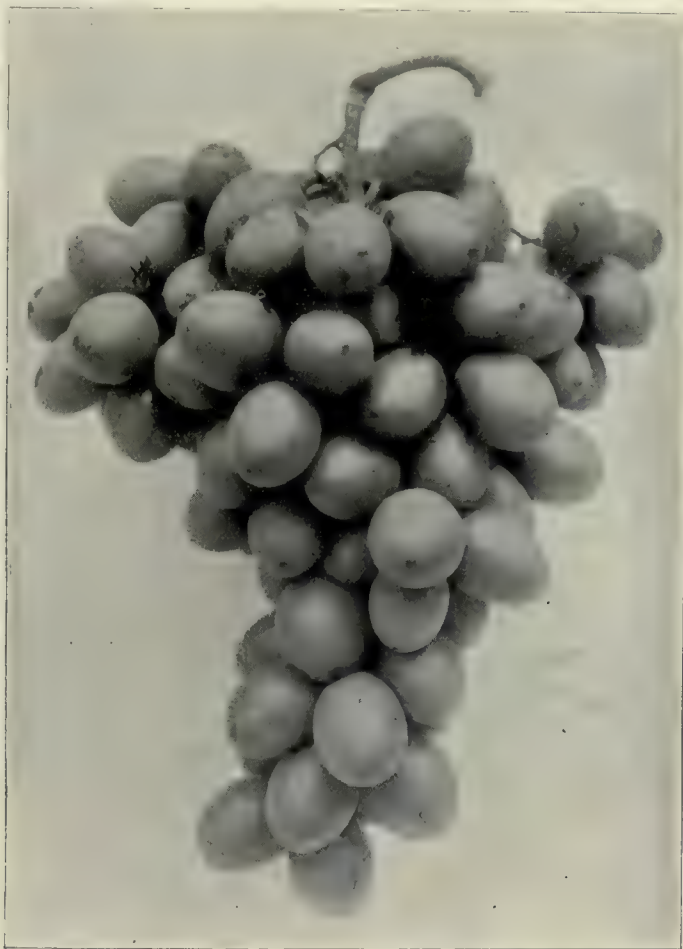


Photo: Russell & Sons, Crystal Palace.

GRAPE DIAMOND JUBILEE (BUCHANAN).

practised, is a barbarous and injurious process. In spring and summer keep a close watch for bug colonies, and touch them with a soft brush dipped in Lemon Oil. Red spider sometimes gives trouble towards the end of the season. Dusting with flowers of sulphur will check it. For thrips sponge the affected leaves with tobacco water or Nicotine Soap, or vaporise lightly. Weevils must be searched for by lamplight, caught, and killed. Rats and mice are troublesome to ripe fruit, and must be trapped. If wasps and flies are numerous, cover the ventilators with fine muslin, and, if necessary, the bunches also. Do not set traps of sweet liquid

caused by sudden rushes of moisture to the berries. Remedy, avoid heavy waterings to Vines ripening fruit, and allow a moderate extension of the sub-laterals. Shankling, *i.e.* the shrivelling of the foot-stalks of the berries, is brought about through the roots being in cold subsoils. Remedy, keep the roots under control. If necessary, lift and replant in autumn, renovating the border at the same time. Bleeding is the copious extravasation of sap from wounds. It is caused, if Vines are cut or broken early in the season before they are in full leaf, by the pressure of sap drawn up from the roots. Remedies, avoid pruning when the buds are

swelling, and apply a cut Potato or a little painters' knotting to the wounds. Scalding of berries and scorbing of foliage are caused by the sun shining on moisture deposited on the berries and leaves during the night. Remedies, keep up an even night temperature, and ventilate early in the morning. In addition to mildew (*Oidium Tuckeri*), several more or less injurious Fungi attack the Vine. Dust with sulphur whenever signs of them are seen, burn all leaves and prunings, and dress the canes in winter with a 10 per cent. solution of sulphate of iron.

For Outdoors :—

Ascot Citronelle. Chasselas Vibert. Espiran.

With the Largest Berries :—

Canon Hall Muscat. Duke of Buccleuch. Gros Colman.

Grape Louse (*Phylloxera*).—*Phylloxera vastatrix*, the Grape or Vine Louse, is the most destructive of all insects that prey upon the Vine. The insects cause the formation of galls on both the roots and leaves of the Vine, and if remedies are not applied the plant dies. The galls on the leaves are chiefly noteworthy because they are the warning signal



Photo : G. E. Nicholls, Waltham Cross.

A GOOD HOUSE OF MUSCAT OF ALEXANDRIA GRAPES.

A Selection of Varieties :—

For Early Forcing :—

Black Hamburgh. Foster's Seedling.

NOTE.—These will do well in pots.

For Mid-season :—

Black Hamburgh.	Gros Maroc.
Buckland Sweetwater.	Madresfield Court.
Diamond Jubilee (see p. 385).	Muscat of Alexandria (see figure).

Late, for Keeping :—

Black.	White.
Alicante.	Gros Colman.
Alnwick Seedling.	Lady Downe's Seedling.
	Mrs. Pearson.

Two for Amateurs :—

Black Hamburgh.	Foster's Seedling.
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that trouble probably exists below. The root galls cause the mischief. After many remedies had been tried, the Association of Economic Entomology recommended a mixture made as follows : Caustic soda (77 per cent. purity), 5 lb.; resin, 40 lb.; water to make 40 gallons. In application this was diluted down to 500 gallons, sufficient to dress 100 Vines at the rate of 5 gallons per Vine.

GRASS (see LAWNs).

GRASSES.

Many Grasses are very ornamental in character, and all the principal kinds are dealt with under their own names in this work. There is a section of annual Grasses which may be raised from seed sown thinly out of doors early in April. Such plants are not only ornamental when growing, but the flowers may, if desired, be cut whilst they are yet clean, and before they commence to drop.

dried, and stored away for winter use. They come in well for mixing with "Everlasting" and fresh flowers, or they may be arranged in vases by themselves, or with other dried subjects. A short list is given of plants that may be thus grown:—

- | | |
|-----------------------------|------------------------------|
| * <i>Agrostis elegans</i> . | — minor. |
| *— <i>nebulosa</i> . | <i>Bromus brizaeformis</i> . |
| — <i>pulchella</i> . | <i>Eragrostis elegans</i> . |
| <i>Aira flexuosa</i> . | * <i>Hordeum jubatum</i> . |
| * <i>Briza maxima</i> . | * <i>Lagurus ovatus</i> . |

Some of these annuals may be sown about the beginning of August if the weather be damp, at the beginning of September if August be dry. The seedlings will stand the winter, as they are perfectly hardy, and naturally the seeds would be self-sown about this time. The following year they will develop sturdy plants, and extra big panicles of flower. Those marked with an asterisk are available for pot culture. Sow the seed thinly, and cover it lightly, towards the end of February. Thin the seedlings gradually until they are about 1" apart. Five inch and 6" pots are the handiest, and as the seed may be sown in them no repotting is required.

GRATIOLA.

Herbaceous plants (*ord.* Scrophularinæ), almost all of which are quite hardy, and can be increased in spring by division. A rich, moist soil suits.

Principal Species:—

- | | |
|------------------------------------|--------------------------------------------|
| <i>aurea</i> , 6", Je., yel. | <i>ramosa</i> , 6", Je., wh. (<i>syn.</i> |
| <i>officinalis</i> , 12", Jy., wh. | <i>quadridentata</i>). |
| striped pur. | |

Other Species:—

- | | |
|------------------------------------------|--------------------------------------------------------------|
| <i>officinalis minor</i> , 8", sum., bl. | <i>pilosa</i> , 12", sum., wh. |
| <i>peruviana</i> , 12", Jy., wh. | <i>tetragona</i> (<i>see</i> <i>Stemodia lobelioides</i>). |

GRAVEL.

Of the numerous sorts of gravel obtainable, the Croydon is the best. If screened before it is laid down, to take out the big stones, and well rolled, it soon sets hard, and makes a firm and agreeable surface for walking on. Seaside gravel is of the least value; as it does not set, but leaves a rough, pebbly surface that is very uncomfortable for pedestrians. (For particulars as to the making of gravel paths, *see* PATHS.)

GRAVESIA.

Stove plants of dwarf habit (*ord.* Melastomacæ), closely allied to the Bertolonias and requiring similar cultural conditions.

Principal Species and Varieties:—

guttata, 1', lil. Several vars., all with beautifully variegated lvs., coloured with wh., grn., ro.; the best are albo-punctulata, margaritacea, roseo-punctulata, and superba.

GREEN FLY (*see* APHIDES).

GREENHOUSE.

A greenhouse is distinct from a conservatory, by reason of the fact that the latter is usually a show house, plants only being taken into it when they are in the height of their beauty, whereas in the greenhouse they are grown on to the flowering stage. In many cases, however, this distinction does not exist, for the term "greenhouse" embraces houses of almost all forms and sizes.

Points of a Good Greenhouse.—Plenty of light is the first essential. Without it plants will grow spindly, and will flower badly. Provision must be

made for admitting plenty of air, for greenhouse plants must never be coddled. Roof lights that will lift up or slide down—the former preferably, as they admit air but keep out the rain—should be fixed. Gratings, opening and closing by shutters, should be fixed in the supporting walls, so that the air is warmed by passing over the hot-water pipes in winter. Side lights, working on hinges beneath the eaves, are advantageous in hot weather. The greenhouse should be supplied with the means of keeping out the frost in winter, and to this end hot-water pipes should be fixed. Without them the utility of the house is much discounted at a time when it should be greatest. (*See* HEATING.)

Aspect and Construction.—The different makes of greenhouses may be divided into three—the span-roof, the half-span or hip-roof, and the lean-to. The first-named is the best of all, for it not only gives the maximum amount of light and air, but is the roomiest and handiest. The half-span and the lean-to both need the support of a wall, and one of these forms is usually adopted when the greenhouse is built on to the dwellinghouse. In all cases the structure should rest upon low, supporting walls of brickwork, except in the case of tenants' fixtures, when posts driven into the ground take the weight. The sides are then made of rough weather boarding. The internal arrangements of a span-roofed greenhouse may consist of a central stage, a path all the way round it, and side stages. The width of these will depend upon the size of the house. Thus, for a house 12' wide the central stage may be 4', the path 2', and the side stages 2' wide. If desired, the central stage may be built in several tiers of shelves, rising one above the other, the highest in the centre. This arrangement is to be recommended where the majority of the plants grown are small, as they are then brought up near to the glass. Where big plants are included, a flat central stage is the better. The stage may be of the "wooden rack" kind, that is, a strong trellis of woodwork, but this is open to the objection that it is too drying for the plants during the summer time. It is, however, cleanly, and has its advantages. A favourite plan is to have a slate bed, the slates being nailed on to a stout framework, and covered with 1" or a little more of white shingle, crushed coke, or "breeze." This provides a moister "bottom" for the plants, and suits them better than the wooden "rack." Both the half-span or hip-roof and the lean-to may have one broad stage fixed to the back wall, a path going round two or three sides of it, and a front stage. For a house 10' wide the back stage may be 5', the path 2' 6", and the front stage 2' 6" wide. These figures are only suggestive, and by no means arbitrary. A span-roofed house should run north and south, so that the sun is shining upon some part of it all day long. Half-span and lean-to erections should lie exposed to the south, or south-east, or south-west, the first-named for preference. A house facing to the north is of very little use for flowering plants, and in many cases the unsuitable aspect is the true cause of failures which are laid to the charge of the nurseryman for supplying bad plants, or the gardener for failing to look after them properly. A north house is suitable for Ferns and foliage plants generally, but for little else.

Temperatures.—Winter minimum, 40° for a cool, 50° for a warm house. During the day a rise of 5° by fire heat and 10° by sun heat, with air, may be allowed. During summer keep plenty of air on,

Green-gage (see PLUMS).

and the temperature of the house will be the shade temperature in the open air. Try to avoid violent fluctuations by the use of the ventilators.

GREENHOUSE PLANTS.

All the plants which naturally grow in the temperate regions of the earth, many of those found in the sub-tropical zones, and a few of those from the tropics, can be grown in the greenhouse, although the last named section do not grow so luxuriantly as they do in greater heat. In addition to these there are the numerous races of florists' flowers, such as Cinerarias, Cyclamens, Primulas, Azaleas, Geraniums, and innumerable bulbs. A very wide range of subjects is thus afforded, and from these a selection may be made that will keep the greenhouse gay throughout the whole of the year without a break. Greenhouse plants naturally fall into three sections—(1) Hard-wooded Plants, including most of the Climbers; (2) Soft-wooded Plants; and (3) Ferns and Bulbs.

Hard-wooded Plants.—The New Holland and South African plants, such as Acacias, Aphelexises (or, as they are now called, Helichrysms), Boronias, Epacrises, Ericas, Pimelæas, and Tetra-thecas, once so highly thought of, have now to a large extent gone out of fashion, and only a few of the best of them are grown. There are signs, however, that they are returning to favour. These do not form nearly the whole of the hard-wooded section. To mention only a few, there are Azaleas, Camellias, Polygalas, Cytisuses (Genistas), and the long array of shrubs—Lilacs, Deutzias, Prunuses, Viburnums, etc.—that may be forced into flower in spring. Almost all hardy flowering subjects are amenable to culture in pots, and if brought steadily on in the greenhouse they may easily be had in flower several weeks in advance of their relatives outside.

Climbers and Pillar Plants.—No greenhouse is properly furnished unless some of its pillars, and at least part of its roof, are covered with climbers. They add immeasurably to the appearance of the house, and, as their period of growth coincides for the most part with our summer, the shade they give is advantageous, rather than otherwise, to the plants on the stages below them. There are numbers of subjects available. Here is a short list of the best. They may be grown either in pots or prepared borders:—

Pillar and Roof Plants:—

Acacia leprosa.	— racemosa.
Bougainvillea glabra.	Rhynchospermum jasminoides.
Cestrum aurantiacum.	Rose Céline Forestier.
— elegans.	— Maréchal Niel.
Cobaea scandens.	— Niphetos.
— scandens variegata.	— W. A. Richardson.
Fuchsias.	Solanum jasminoides.
Hibbertia dentata.	Swainsonia coronillifolia
Jasminum grandiflorum.	(syn. galegifolia).
Kennedya prostrata.	Tacsonia Van Volxemii.
Lapageria rosea.	Tecoma (Bignonia) radicans.
— rosea alba.	Tibouchina macrantha
Lonicera sempervirens.	(correctly T. semide-
Passiflora cærulea.	candra var.).
— cærulea Constance Elliott.	

Basket Plants:—

A few baskets suspended from the roof add much to the appearance of the house. They should be hung just high enough to allow room to pass under them. A short list is appended:—

Asplenium bulbiferum.	Begonia Gloire de
— fabianum.	Lorraine.
— flaccidum.	Campanula isophylla.

— isophylla alba.
— isophylla Mayi.
Climanthus Dampieri.
Ivy-leaved Geraniums
(Pelargoniums).

Lotus Bertholetii.
Mimulus moschatus Harrisonii.
Woodwardia radicans.

Soft-wooded Plants.—In this section come such popular subjects as Calceolarias, Cyclamens, Primulas, Pelargoniums, Cinerarias, and Carnations. Taken as a whole, these plants are easier to grow than hard-wooded subjects.

Ferns and Bulbs.—There are many Ferns which do well in a greenhouse temperature (*see* FERNS). They should be given the shadiest corner of the house, and, if it is possible to avoid it, should not be mixed with the other subjects. They like a place to themselves. In addition to the indispensable Dutch bulbs, without which no greenhouse is complete, there are many bulbous subjects that are equally amenable to culture, but are often forgotten. Crinum Powellii, Nerines, Babianas, Ixias, and Gladioli are cases in point. The favourite Tuberous Begonias, although not strictly "bulbous," may be referred to here. They are a host in themselves.

GREEN MANURES.

This general term is applied to crops grown for the express purpose of enriching the soil. They are, as a rule, Leguminous plants, and they are dug or ploughed in when in full growth; by this means the fertility of the land is increased by the added humus resulting from vegetable decay, and also by the nitrogen which such plants fix by means of their root nodules.

GREVILLEA.

Description.—Australian plants (*ord.* Proteaceæ), generally of a shrubby character, though some attain to the dimensions of small trees under cultivation, and reach great heights in their own country. All are evergreen, and in many instances the foliage is elegant and graceful, particularly robusta, which is a popular plant for table decoration, and is grown extensively for market. Some few species require no protection in extreme southern or especially favoured gardens, but it is best to regard all members of the genus as cool greenhouse plants.

Soil.—Equal parts of peat and loam, with a free use of sharp sand, form a suitable rooting medium.

Propagation.—Cuttings of newly ripened shoots may be rooted in sand under a bell-glass or in a propagating case, placing the pots in bottom heat as soon as the bases of the cuttings have callused. Grevillea robusta has very rarely flowered in this country, but seed is regularly imported, and provides a ready means of increasing or renewing stock. The seed is best sown in light soil over a gentle bottom heat and kept moist.

Other Cultural Points.—On no account must the young plants become drawn or attenuated, as there is little beauty in a weak specimen. When grown as a room plant robusta will be much benefited if placed out of doors during rain in summer and autumn; 5" or 6" pots afford sufficient root room for quite large specimens.

Principal Species and Varieties:—

alpina, 6', My., red, yel.	Banksii, 20', Je., red.
(syn. alpestris).	robusta, 10' to 50', sum.,

Greenovia (*see* *Sempervivum*).

Green Rosehafer (*see* *Roses*).

Gregoria vitaliana (*see* *Androsace vitaliana*).

or. Varietal forms are elegantissima and filicifolia, but they are seldom met with.

Other Species :—

aspera, 4', Je., pk.
 asplenifolia, 6', Jy., pk.
 (syn. longifolia).
 Baueri, 4', Je., red.
 buxifolia, 6', Je., pk.
 (syn. Embothrium buxifolium).
 Caleyi, 6', Je., red.
 Drummondii, 6', Je., wh.,
 yel.
 ericifolia, 6', win., red,
 grn.

rosmarinifolia, 6', Je., red.
 thelemanniana, 5', spr.,
 yel., grn., red (syn.
 Preissei).

fasciculata, 6', spr., red.
 Forsteri, 6', sum., sc.
 glabrata, 6', My., wh.
 (syns. Manglesii and
 Manglesia glabrata).
 juniperina, 6', Je., pk.
 — sulphurea, 6', Je., yel.
 linearis, 6', Je., wh.;
 wh. and flesh coloured
 forms.
 punicea, 3', Je., pur.
 sericea, 6', Je., pk.

GRIAS.

This family (*ord.* Myrtaceæ) is chiefly remarkable for its economic value, as it includes the Anchovy Pear (*cauliflora*). The members are tall, large-leaved trees, that require stove treatment and a compost of rich, light loam. Propagation, by cuttings of ripened growth inserted in sandy soil under a bell-glass.

Principal Species :—

cauliflora, 40' to 50', sum., wh. Anchovy Pear. zamorensis, wh. lvs. 1' to 2' long.

GRIFFINIA.

South American bulbous plants (*ord.* Amaryllideæ), closely related to Amaryllis and Lycoris, and usually bearing blue flowers. They need the



GREYIA SUTHERLANDII.

GREWIA.

Stove or warm greenhouse trees (*ord.* Tiliaceæ), that thrive in light, rich soil, and are readily increased by cuttings inserted in very sandy soil under a bell-glass.

Principal Species :—

asiatica, 12', sum., yel. occidentalis, 12', sum., pur.

GREYIA.

An interesting deciduous shrub (*ord.* Sapindaceæ) from the Cape. It requires warm greenhouse protection, and grows best in a light, rich soil. Propagation, by seeds or cuttings of half-ripened growth. When at rest the plant should be kept rather dry.

Only Species :—

Sutherlandii, 6', spr., crim., sc. (see figure).

temperature of a stove or intermediate house. Propagation, by seeds sown in spring, or by offsets at potting time. Soil, loam, peat, sand, and dried cow manure. When growing vigorously give abundance of moisture, but during the season of rest withhold water and reduce the temperature to about 45°.

Principal Species :—

Blumenavia, 1', sum., pk. hyacinthina, 14', Jy., bl.
 dryades, 1½', sum., pale ornata, 1', Meh., lil.
 bl.

Other Species :—

hyacinthina micrantha, liboniana, 8', spr., bl.
 1', aut., bl. parviflora, 2', Aug., pur.
 intermedia, 9', spr., bl.

Grey Gum (see Eucalyptus resinifera).

GRINDELIA.

Hardy or half-hardy plants (*ord.* Compositæ) chiefly from North America. The evergreen species are propagated in spring by cuttings of half-ripe growth inserted in sand under a bell-glass; the herbaceous species by division or cuttings. A warm position, and ordinary garden soil, suffice, but the genus is not showy enough to merit extended cultivation.

Principal Species :—

angustifolia, 1½', Aug., yel. (<i>syn.</i> Duvallii).	grandiflora (<i>see</i> squar- rosa).
glutinosa, 2', Aug., ev., yel. (<i>syn.</i> Donia glutinosa).	inuloides, 2', Aug., ev., yel. (<i>syn.</i> spatulata).
	squarrosa, 2', Aug., yel. (<i>syn.</i> Donia squarrosa).

Other Species :—

ciliata, 1½', aut., bien., yel. (<i>syn.</i> Donia ciliata).	spatulata (<i>see</i> inuloides).
Lambertii, 2', aut., ev., yel.	speciosa, 2', aut., yel.

GRISELINIA.

The few members of this genus (*ord.* Cornacæ) are Laurel-like shrubs or small trees, hardy in southern and sheltered parts of the kingdom, but requiring greenhouse protection in other localities. Propagation, by cuttings of firm growth, or by layering. Light, but deep, rich soil is essential.

Principal Species :—

littoralis, 25', spr., ev., grn.	lucida, 10', spr., ev., grn. — macrophylla, large lvs.
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GRISLEA.

Evergreen, shrubby stove plants (*ord.* Lythraceæ). Propagation, by cuttings of firm growth in spring, in bottom heat. Soil, fibrous loam and peat, with sand.

Principal Species :—

secunda, 4', sum., pk., sc.	tomentosa (now Wood- fordia floribunda).
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GRONOVIA.

Interesting annuals, raised from seed sown in heat, and grown in a stove or warm greenhouse. Strings, wires, or sticks must be provided for the plants to climb up: This genus (*ord.* Loasæ) is remarkable for its stinging hairs.

Principal Species :—

scandens, 6', sum., yel.

GROTTO.

Sometimes an unattractive jumble of plants, stones, shells, and soil is called a grotto, but this is a misnomer. A grotto should be a cool, shady spot, where rockwork and old tree stumps and roots are used with sufficient soil to make an undulating and artistic garden, in which Ferns and many shade-loving plants are grown. Water, too, should form part of the picture, indeed, heavily shaded dells by the brook side, river backwater, or lake form ideal spots for the formation of grottoes.

GRUBS.

By this collective title nearly all caterpillars and pupæ are popularly referred to, but many also

Ground Cherry (*see* Cerasus Chamaebuxus).

Ground Ivy (*see* Nepeta Glechoma).

Ground Laurel (*see* Epigaea repens).

Ground Nut (*see* Arachis).

Groundsel (*see* Senecio vulgaris).

Groundsel Tree (*see* Baccharis halimifolia).

include slugs and shell-less snails in the same term. The small larvæ of such garden pests as the Cabbage Fly, Carrot Fly, Celery Fly, Celery Stem Fly, Codlin Moth, Currant Sphinx Moth, Gooseberry Sawfly, Onion Fly, Narcissus Fly, Raspberry Leaf-miner, Rose Beetle, Slug Worm, Turnip Flea Beetle, Turnip Leaf-miner, etc., are, however, those generally referred to by gardeners as grubs. Methods for combating these enemies will be found under the various crops.

GUAIACUM.

West Indian trees (*ord.* Zygophyllæ), best known for its heavy wood and the medicinal properties of the bark of officinale, a species known as the Lignum Vitæ tree. Evergreen stove trees, that will grow in rich, light loam, and are increased by cuttings in spring, in bottom heat.

Principal Species :—

arboreum, 30', sum., bl.	verticale, 12', sum., bl.
officinale, 45', sum., bl.	

GUANO.

Briefly stated, guano is the accumulated deposit of sea birds' excrement, found upon certain islands and coasts where there is a small rainfall. The value of guano lies chiefly in its nitrogen, which is mostly in such combinations as hydro-chlorate, oxalate, phosphate, urate, etc., of ammonia. But the supply of guano has decreased rapidly, and its quality has fallen also. With the decrease of the percentage of ammonia there has been an increase of phosphates. In short, as a nitrogenous manure natural guano is passing out of the market, and its place is being taken by fish guano and other artificial productions. In a dry state guano is an excellent top-dressing for almost all kitchen garden crops, but, being highly stimulative, should not be applied to crops during autumn or winter. It is better to give two applications, with an interval and change of manure between, than to give a large dose at one application. According to the quality of the guano the rate of application should be from 1 oz. to 3 oz. per square yard. Plants in pots should not be given guano until the pots are fairly well filled with roots; it may then be given to Begonias, Chrysanthemums, Pelargoniums, Balsams, etc., in liquid form, not more often than once a week, at the rate of ½ oz. dissolved in 1 gallon of water. Liquid cow manure forms an excellent change of food for guano-fed crops.

GUAREA.

Evergreen stove trees (*ord.* Meliaceæ), requiring similar cultural treatment to that outlined for Guaiacum. The several species grow about 25' high, and bear white flowers. The chief are coffeefolia and ramiflora.

GUATTERIA.

Stove trees and shrubs (*ord.* Anonacæ), with evergreen foliage. All can be increased in spring by cuttings placed in sandy soil in bottom heat. Cerasoides, Korintii, and suberosa are now referred to the genus Polyalthia.

Principal Species :—

rufa, 6', br.	virgata, 30', wh., fragrant.
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Gryllus (*see* Crickets).

Gryotalpa (*see* Mole Crickets).

Gualtheria (*see* Gaultheria).

GUAVA.

The fruits of several species of *Psidium* (which see) are known under this title, but the best are produced by *Guava pomiferum*, *montanum*, and *cattleianum*. All these may be grown in an intermediate house, and produce purplish, Plum-shaped fruits, having a flavour somewhat like that of a Strawberry. A delicious preserve known as Guava jelly can be made from these, or they may be used fresh for dessert.

GUAZUMA.

Evergreen stove trees (*ord.* Sterculiaceæ) that will succeed under the treatment advised for



(GUELDER ROSE (*VIBURNUM OPULUS*).

Guaiacum. One species, *tomentosa*, has some economic value, the timber being useful for sugar barrels, while from the young growths a very strong cordage fibre can be obtained.

Principal Species :—

polybotrya, 15', sum., yel. *tomentosa*, 25', sum., yel.
(*syn.* *Bubroma poly-* *ulmifolia*, 40', sum., yel.
 botrya).

GUELDER ROSE.

A popular name applied to *Viburnum Opulus* (*ord.* Caprifoliaceæ). It is a native shrub, growing to a height of 10' or 12'. The typical plant bears heads of whitish flowers in May, followed by bright red fruits. The form usually cultivated has sterile flowers with large white bracts. The heads are large, globular, and very effective. It is easily propagated by cuttings, and grows well in any good soil. *V. Opulus*, variety sterile, is a useful shrub for forcing.

GUERNSEY LILY.

A beautiful bulbous plant, of which immense quantities are imported by bulb dealers in late summer and early autumn. Early potting is very important. For full particulars, see *NERINE SAR- NIENSIS*.

GUICHENOTIA.

Curious Australian shrubs (*ord.* Sterculiaceæ), with downy stems and leaves, and small, whitish or purplish flowers. The leaves are usually small and narrow, the branches weak, and the largest bushes rarely exceed 2' in height. Propagation, by cuttings inserted in sandy peat under a bell-glass. Soil, sandy peat. A cool greenhouse provides the necessary protection.

Principal Species :—

ledifolia, 1½' to 2', spr., wh. *macrantha*, 1½' to 2', spr. pur.

GUMMING or GUMMOSIS.

The exudation of resinous matter commonly observed in Cherries, Plums, Peaches, and Nectarines. Many of the so-called gums and resins of commerce, as, for instance, Gum Arabic and Gum Tragacanth, are the result of gummosis on the part of certain trees—in the cases noted, Acacias. In cultivated fruits gummung is a wasting disease, which every up-to-date cultivator does his best to prevent, or cure. The wounds or fissures in the bark from which the "gum" exudes may be caused in a variety of ways. Dr. Beijerinck lays the blame upon the action of a very contagious fungus which he has named *Coryneum Beijerinckii*. The mycelium of this fungus appears to develop a ferment that, penetrating from cell to cell of the tissue, transforms the starch granules, cell walls, etc., into gum. Diseased tissue is formed, fissures appear, and the gum exudes.

Commonly, however, gummung is to be traced to very much simpler causes, which are well within the power of the cultivator to prevent from acting. Abrasions of the bark, through branches being allowed to cross, and careless pruning—including too rash excision of large branches, the making of jagged cuts, and pruning in frosty weather—are fertile causes, especially with Cherries and Plums. The remedy here is careful pruning in the summer and early autumn, which in itself will reduce gummung to a minimum, and the dressing of the wounds with some good styptic, such as Stockholm tar.

Injury from frost, and over-rich soil, are common causes, and the two are usually very closely linked together. It will always be seen that trees growing in rich soil suffer most severely from frost, and gummung usually follows. Lifting and root pruning in early autumn naturally suggest themselves as correctives of an over-luxuriant habit on the part of the trees.

Plums and Cherries that are badly affected with gummung can rarely be cured, but mild cases may be ameliorated by (1) cutting out the affected parts, where the branches are not too large; (2) due attention to summer pinching, thus obviating the necessity for much winter pruning; (3) dressing with Stockholm tar; (4) keeping the trees free from insect enemies; (5) choosing varieties suitable to the locality.

GUM TREE, BLUE (see *EUCALYPTUS*).

Guilandina (see *Cesalpinia*).

Guinea Peach (see *Sarcoccephalus*).

Gum Ammoniac (see *Dorema Ammoniacum*).

Gum Cistus (see *Cistus ladaniferus*).

Gum Elemi (see *Amirgis Plumieri*).

Gum Senegal (see *Acacia Senegal*).

GUNDELIA.

A Thistle-like genus (*ord.* Compositæ). It is a hardy herbaceous perennial, growing into a large bushy plant, with spiny leaves and purplish flower heads. It grows readily from seeds, and succeeds in any ordinary garden soil.

Only Species :—

Tournefortii, 2', sum., pur. (*syn.* *glabra*).



GYMNOGRAMME CALOMELANOS (*see* p. 394).

GUNNERA.

A small genus of hardy herbaceous perennials (*ord.* Haloragacæ), with large, showy leaves. *Manicata* and *scabra* make very ornamental subjects for the wild garden, or for planting by the side of streams and lakes. In such positions the leaves will frequently attain to a size of 5' or 6' across, and they are quite distinct in appearance from the foliage of any other subject available for outdoor gardening. Although reputedly hardy, the crowns should be covered with a thick mulching of partly decayed manure, leaves, or dry litter in the autumn, otherwise losses are likely to occur. Once established, the plants will grow and flourish in the same position for an indefinite period. Propagation is by division of the crowns in spring. A rich, moist soil is necessary to get full-sized foliage.

Principal Species :—

chilensis, 4' to 5', lvs. 4' to 5' across, flowers red, small (*syn.* *scabra*).
— major, a handsome var.
magellensis, 6", Jy., tender in cold places.
manicata, 4' to 6', lvs. 4' to 6' across.
perpensa, 1½', Aug., grn.
scabra (*see chilensis*).

GUSTAVIA.

Tropical trees and shrubs from South America (*ord.* Myrtacæ), with large, handsome, evergreen leaves and showy red, white, or cream flowers.

Although they grow naturally to large dimensions, they can be flowered in a small state, but are not often seen in cultivation. Propagation, by cuttings in light, sandy soil in a warm propagating case. Soil, loam and peat. At all times a stove temperature is required.

Principal Species :—

augusta, 20' to 30', sum., wh., suffused ro. on outside (*syn.* *insignis*).
gracillima, 30', sum., ro. red.
insignis (*see augusta*).

GUTIERREZIA.

Neat little herbaceous or sub-shrubby plants (*ord.* Compositæ), with yellow flowers, in bunches at the ends of the branches, and narrow leaves. Propagation, by seeds, division, or cuttings in spring. Suitable for sunny positions in the rockery in light soil.

Principal Species :—

Euthamiae, 9", Je., yel.
gymnospermoides (now *Xanthocephalum gymnospermoides*).

GUZMANIA.

A small genus (*ord.* Bromeliacæ), with long, leathery leaves, and pretty flowers surrounded by brightly coloured bracts. Soil, fibrous peat, charcoal and sandstone. The plants require a tropical temperature, and like plenty of water while growing.



GYMNOGRAMME PEARCEI (*see* p. 394).

Principal Species :—

bulliana, 1', flowers yel., bracts sc.
tricolor, 1' to 1½', sum., bracts pur., blk., red.

GYMNEMA.

Stove evergreen, climbing, or bushy shrubs (*ord.* Asclepiadæ) from Asia, Australia, etc. They are

Guttapercha Tree (*see Isomandra*).

distinguished by opposite leaves, milky juice, and yellowish or whitish flowers. The milky juice of some species is collected by some Asiatic races and used in the same way as cow's milk. Cuttings root readily in a close, warm propagating case, and a mixture of fibrous peat and loam suits them.

Principal Species :—

acuminatum, 12', sum., *tenacissima* (see *Marsdenia tenacissima*).
yel.
crenatum, 10', sum., yel.

GYMNOCLADUS.

Hardy trees from North America (*ord.* Leguminosæ). The only species cultivated is *canadensis*, the Kentucky Coffee Tree. It grows to a height of 30', and has white flowers. When young the stems are whitish. It is increased from seeds, and grows well in loamy soil.

GYMNOGRAMME.

Description.—A large and important genus of Ferns (*ord.* Filices), chiefly natives of tropical countries, and thus requiring for the most part a stove temperature in cultivation. A few may be grown in a cool house, including the annual species *leptophylla*, which is scattered through the warmer temperate regions of the globe, and approaches the British Islands as close as Jersey. The popular name of Gold and Silver Ferns applied to the *Gymnogrammes* is due to the presence of a fine white or golden powder, with which the under surfaces of the fronds are plentifully besprinkled.

Propagation.—By spores. *Gymnogrammes* produce an abundance of spores, and these germinate with great freedom wherever a fair amount of moisture and heat is to be obtained. It is a curious fact that they will grow upon the stages, in crannies in the walls, and between the spars of wooden floor trellises, when they will refuse to grow in pots of carefully sterilised soil. The propagation of the rarer species and varieties should not, however, be left to chance. The sterilising of the soil, although not absolutely necessary, is advisable. The spores should only be sprinkled upon soil (not covered) that has been previously watered, and each pot should be covered with a sheet of glass. This glass should be removed daily, and the condensed moisture upon it wiped off. Subsequent waterings, should they prove necessary, should be given by standing the pot or pan in a few inches of water for an hour or two.

Soil.—A light, and yet rich, medium is necessary. One-third each of good loam, peat, and leaf soil, with plenty of sand, will answer well. Some growers mix Cocoanut fibre refuse with the compost, but this is not to be recommended, except for young plants which will soon be given another shift, as the fibre has a tendency to turn sour, and react unfavourably upon the tender roots. Older plants may have a little more loam given to them, but in any case it must be fibrous, and not clayey or sticky.

Other Cultural Points.—*Gymnogrammes* are regarded as being difficult to grow, and to some extent this is true. An hour's neglect in watering a dry plant on a hot day means its death; for once the fronds flag they rarely recover, and the fine roots are equally tender. Many a fine specimen has been killed in this way. The plants must have plenty of water at the roots at all times. They are equally impatient of the other extreme—a

water-logged soil. The fronds should never be sprinkled with water, and even the damping of the stages, which is so beneficial to other Ferns, should be avoided. Liquid cow manure may be given about once a week to vigorously growing plants in summer, but stimulants are highly injurious to them in winter. *Gymnogrammes* have a strong dislike to draughts, and on that account do not make good subjects for rooms or corridors. The ventilation of the houses must be managed with the greatest care, and anything like a cold current of air avoided.

To Resuscitate Unhealthy Specimens.—Sometimes an old and apparently worn-out plant may be given a new lease of life by shaking it out of the old soil and planting it temporarily in a bed of Cocoanut fibre refuse, with bottom heat. To attempt to reduce old specimens, and pot them up in the usual way at once, is to sign their death



GYMNOGRAMME PULCHELLA VAR. WETTENHALLIANA
(see p. 394).

warrant. They never do any good. Young plants, it may be noted, are always much easier to grow than old ones; in fact, most *Gymnogrammes* seem to have a very limited life. Young plants should thus be continually raised from spores.

Gymnogrammes as Basket Ferns.—From the pendent and sub-pendent habit of the fronds *Gymnogrammes* make excellent basket plants, always provided that the water question receives due attention. The best of all for the purpose are *elegantissima* and *schizophylla*, and the latter's variety *gloriosa*. *Decomposita* is hardier, but scarcely so elegant. Some of the crested varieties of *calomelanos* and *pulchella* are also suitable for basket work.

Principal Species, Varieties, and Hybrids :—

[NOTE.—The lengths given below refer to the size of the fronds, not to the height of the plants. The latter may be taken to be about two-thirds of the former. The colours refer to the farina or powder. All require stove heat, except where otherwise stated.]

calomelanos, 1' to 3' long, 6" to 12" broad, creamy wh.; very variable, many vars. (see p. 392).
— chrysophylla, 1½' to 2' long, golden yel., brightest of all. Many sub-vars., of which the crested form grandiceps; laucheana, with its triangular fronds, and also its crested form: Massouii, which has very long, relatively narrow fronds; and Parsonsi, 1', heavily tasselled and dark golden, are the best.
— peruviana, 1' to 2', fronds triangular. Several sub-vars., one, argyrophylla, 1½' to 2½' long, silver, being generally recognised as the finest of all the Silver Ferns. Mayi has light, sulphur yel. powder on both the upper and under surfaces of the fronds.
decomposita, 1' to 1½' long, 1' broad, br., yel. A natural hybrid between Pearcei and calomelanos chrysophylla; one of the most vigorous of the genus.
elegantissima, of garden origin, very close to schizophylla, which it resembles, but referred to decomposita by the *Kew Hand-List*.
japonica, 1½' to 2' long,

1' broad, grh. Has no powder, and is more like a Pteris in general appearance than a Gymnogramme. Javanica is very close to it, and probably the one is a geographical var. of the other. There is a variegated form, but it is rarely seen in cultivation.

Lathamiae, 2' to 2½', silver, a hybrid between decomposita and schizophylla.

Pearcei, 1½' long, 1' broad, triangular, silver (see p. 392).

pulchella, 9" to 18" long, 4" to 6" broad, silver.

— wettenhalliana, a crested var. with smaller fronds and sulphur yel. powder (see p. 393).

schizophylla, 1½' to 2½' long, 6" to 9" broad, forked, very slightly powdered, silver, good for baskets.

— gloriosa, } strong.
— — superba, } growing vars., admirable basket Ferns.

sulphurea, 6" to 12" long, 3" to 4" broad, gold, the smallest of the gold Ferns; rather tender.

tartarea, 1' to 2' long, 6" to 12" broad, triangular, silver.

— ochracea, like the type in habit, but has golden powder.

Other Species and Varieties :—

abyssinica, 1' long, ½" broad, smooth.
alismæfolia, 5" to 9" long, 2" to 2½" broad, smooth.
argentea, 6" to 12" long, 3" to 4" broad, silver.
caudiformis, 6" to 9" long.
chærophylla, 4" to 8" long, 2" to 4" broad, smooth, ann.
ferruginea, 1' long, 3" to 5" broad, woolly. Var. lanata has larger pinules and less wool.
flexuosa, 3' to 4' long, of climbing habit.
hamiltoniana, 6" to 12" long, smooth.
hispidula, 3" to 6" each way, woolly.
javanica, 1' to 4' long, ½" to 3" broad, smooth;

close to japonica, which see.

leptophylla, 2" to 4" long, 1" to 1½" broad, ann. The Annual Maiden-hair.

macrophylla, 1' to 1½' long, 3" to 4" broad.

rufa, 1' to 1½' long, 3" to 5" broad, woolly on lower surface.

rutaefolia, 2" to 3" long, grh.

tomentosa, 9" to 15", woolly.

triangularis, 3" to 4" each way, triangular, grh., golden, very variable.

trifoliata, 2' to 3' long, 6" to 8" broad, once pinnate, silver or gold, very variable.

that being anceps, an Australian plant with large ornamental leaves and white flowers. Propagation, by division of the tubers in spring, or by seeds. Soil, peat and loam. It requires abundance of moisture whilst growing, and none at all when at rest.

GYMNOSTACHYUM.

Intermediate house or stove evergreen shrubs (ord. Acanthaceæ), with erect racemes of tubular flowers. They may be propagated and grown under the same conditions as Eranthemums, and, like those plants, are best grown from cuttings each year.

Principal Species :—

ceylanicum, 9", sum., yel. decurrens, 8", sum., wh.

GYNANDROPSIS.

Annual herbs (ord. Capparidæ), half-hardy, or needing a greenhouse temperature for the most part. Although the flowers of several of the species are comparatively large and showy, the plants are seldom seen. They may be raised from seeds sown in heat in spring, the plants being



GYNERIUM ARGENTEUM (correctly CORTADERIA ARGENTEA).

subsequently transferred to their flowering quarters outside. A light but rich soil and a sheltered but sunny position are the chief cultural requirements.

Principal Species :—

coccinea, 6' to 9', sum., grh., wh. (*syn.* Cleome pentaphylla of *Botanical Magazine* 1681).
pentaphylla, 2', Je., Jy., grh., sc.

GYNERIUM. (PAMPAS GRASS.)

Although this genus (ord. Gramineæ) is still kept up, one species only is placed in it, and the plant which has done most to make it famous—argenteum, the elegant Pampas Grass—is referred by botanists to Cortaderia argentea. All the Gyneriums are handsome Grasses, of stately presence, but argenteum and saccharoides are the two chief members. Argenteum is hardy,

Gymnopteris (see *Acrostichum*).

Gymnothrix (see *Pennisetum*).

Gynandra (see *Erythraea*).

GYMNOSTACHYS.

Greenhouse herbaceous plants with tuberous roots (ord. Aroidæ). One species only is known,

of vigorous growth, and makes bold, handsome clumps in a few years. It is thus a capital lawn subject. Its requirements are a sheltered position (it dislikes wind-swept districts), and a rich, light soil, plentifully enriched with organic manure. Stock may be raised from seed sown under glass in gentle heat, the young plants being grown on in pots until they are about 1' high. The plumes, if required for indoor decoration, should be cut as soon as they are fully expanded, and before they are soiled with soot and dirt or beaten about by rain. *Saccharoides* is a stove sub-aquatic that is very seldom cultivated in this country. Its plumes, however, which are of great size, and much looser than those of *argenteum*, are imported in great

Principal Species :—

aurantiaca, 2', lvs. and stem pur. *bicolor*, 2' to 3', flowers yel., lvs. purplish.

sarmentosa, 8', yel.

GYP SOPHILA.

Description.—Elegant hardy annuals and perennials (*ord.* Caryophyllæ). Upwards of fifty species have been described, but the one chiefly met with is *paniculata*. This is not only a good border plant, but it is of the greatest value for cut flower purposes. It is grown in great quantities for market, to supply the cut flower trade, and its charmingly elegant appearance when cut is daily winning for it fresh friends.

Propagation.—By seeds, sown as soon as ripe ;



(*GYP SOPHILA REPENS* (see p. 396).)

numbers under the name of *Uva Grass*. They may be had in the natural colour, silver frosted, or dyed with various colours, and they play an important decorative part.

Principal Species :—

argenteum, 5' to 7', aut., hdy., yellowish wh., lvs. grn. (correctly *Cortaderia argentea*, see p. 394). There is a var. with grn. and golden

lvs., called *argenteo-lineatum*.

jubatum (correctly *Cortaderia jubata*), has fine plumes.

saccharoides, 8' to 12', Sep., st., wh., sub-aquatic. *Uva Grass*.

GYNURA.

Stove plants (*ord.* Compositæ). Their chief beauty lies in their leaves, which are often highly coloured, or covered with brightly tinted hairs. They are increased from cuttings, and succeed well in light soil in a warm, moist atmosphere, shaded from bright sunshine. It is advisable to root cuttings annually.

and by root division, performed before growth starts in the spring. *Elegans* does well if raised from seed each spring. The flowers are not so graceful as those of *paniculata*, although they are considerably larger ; but *elegans* is a plant of easy growth, and should not be lost sight of.

Soil.—*Gypsophilas* like a light, rich soil of considerable depth, containing plenty of chalk or old lime rubble. But they will do in any ordinary garden soil, provided it be well worked, and not cold.

Other Cultural Points.—It is advisable that some, at least, of the plants of *paniculata* should be grown in a warm, sheltered spot, otherwise the season will be well on before the flowers appear. The clumps should not be disturbed for years together. Once they get hold, all they want is a mulching in spring and autumn of short, well-rotted dung from the yard. Also in dry seasons they like plenty of water. It will be wise to cut some of the flowers early, for the clumps bloom in

such prodigal fashion that if the flowers are allowed to remain on for long the plants are seriously weakened.

Principal Species :—

cerastioides, 3½', My., per., wh. Aug., per., wh.; root-stock fleshy.
elegans, 6'', sum., ann. or — flore pleno, 3', Je., per., wh.; a handsome double var.
paniculata, 2' to 3', Je., repens, 6'', per., wh. (see p. 395).

Other Species :—

fastigiata, 1', Jy., per., pale red
glauca, 1½', Jy., per., wh. *perfoliata*, 2' to 3', Jy., per., pk.
Stevenii, 1' to 2', Jy., per., wh. or ro.



HABENARIA CARNEA.

GYPSUM.

Chemically, gypsum is known as sulphate of lime, but it is better known as plaster of Paris. Its chief use to the gardener or farmer is as an absorbent of ammonia, which is a valuable but volatile fertiliser, given off freely during the decomposition of almost all animal manures. A thin layer of gypsum placed over the newly-turned manure heap not only makes decomposition slower, but prevents waste, because when dug into the soil it slowly gives to the land the nitrogenous fertiliser which it previously absorbed in the form of ammonia.

HABENARIA.

Description.—A genus of upwards of 400 species of Orchids (*ord.* Orchidaceæ). Many of the hardy species are beautiful, including the British *bifolia* and its forms. They are gems for nooks in the rock garden. Comparatively few of the stove species are cultivated. The genera *Cœloglossum*,

Gymnadenia, *Phyllostachya*, and *Platanthera* are now merged in *Habenaria*. The plants are all terrestrial.

Propagation.—By division of the rootstocks after growth has finished for the season, or before it starts again in the spring. The divisions of the hardy species should be potted singly into small pots, and kept in a cold frame until they start. With the stove species a close propagating case is necessary.

Soil.—For the stove species, two-thirds of peat, one-third of good fibrous loam, and a little live sphagnum, chopped, with sand. For the hardy species, light and peaty.

Principal Species and Varieties :—

bifolia (the Butterfly Orchis), 1', Je., hdy., wh., native; many vars. The chlorantha section, by some botanists considered to belong to a distinct species, has larger flowers.
carnea, 10'', sum., pk. (see figure).
 — *nivosa* (*syn.* *alba*), wh.
decipiens, Sep. to Nov. (*syn.* *longicalcarata*).
fimbriata, 1' to 1½', sum., hdy., lil. pur.
Helloborina, Sep., st., grn., flesh pk. (*syn.* *Eulophia Helloborina*).
Lugardii, 2'', early sum., wh. spurs 6'' long.
militaris (*see pusilla*).
pusilla, 1', sum., aut., sc., grn. (*syn.* *militaris*).
rhodocheila, 9'' to 10'', Aug., grh., sepals grn., lip bright cinnabar red.
Susanæ, 4'', Jy., st., grn., wh., fragrant (*syn.* *gigantea*).

Other Species :—

Blephariglotis, My., Je., hdy., wh., fringed.
candida (*see subpubens*).
ciliaris, 1½' to 2', hdy., or., yel.
cristata, 1', late spr., hdy., gold, yel., lip fringed.
dilatata, 1' to 2', sum., hdy., wh.
gigantea (*see Susanæ*).
Hookeri, 6' to 12'', Je., hdy., grn., wh., twenty to thirty flowers on a spike.
psycodes, 10'' to 12'', Je., hdy., ro., crim.: resembles *fimbriata*, but has smaller flowers.
rotundifolia, 1½' to 3', sum., hdy., ro., pur., lip wh.
salaccensis, 12'' to 14'', Ap., st., grn., red, or. tipped spur, roots tuberous.
subpubens, 1', Aug., st., wh. (*syn.* *candida*).

HABERLEA.

A pretty herbaceous rockery perennial (*ord.* Gesneraceæ), resembling a small *Gloxinia* in appearance, the flowers being borne amidst a tuft of leaves. Propagation, by seeds and by division of the crowns in spring or autumn. Soil, peaty.

Only Species :—

Heldreichii is now referred to *Ramondia Heldreichii*.
rhodopensis, 4'' to 6'', Ap., hdy., pale lil., wants a little protection in cold places.

HABLITZIA.

A small and unimportant genus (*ord.* Chenopodiaceæ) of one species only—*tamnoides*, July, October, green—a tall, hardy, climbing herb of straggling appearance. Propagation, by division of the root, or by seeds, in spring. Ordinary garden soil.

HABROTHAMNUS (see CESTRUM).

HACKBERRY.

A popular name given to the fruit of *Celtis crassifolia*. (*See* *CELTIS*.)

HACQUETIA.

A hardy perennial plant (*ord.* Umbelliferae), rather curious, but distinct and pretty. It is

Habranthus (*see Hippeastrum and Zephyranthes*).

slow growing, and likes to be planted in a sheltered nook in the rock garden, and left undisturbed. Propagation, by division of the roots before growth starts in spring, but only strong clumps should be touched, or division will be fatal. Soil, sandy loam.

Only Species :—

Epipactis, 3' to 6', spr., yel., lvs. yel., grn. (*syn.* *Dondia Epipactis*).

HÆMANTHUS.

Description.—Remarkably fine bulbous plants (*ord.* *Amarylidae*), all natives of Africa, and requiring for the most part a stove or warm greenhouse temperature. Some of the species have flowers of great beauty, and several beautiful hybrids have been raised on the Continent. The huge umbels of flower are nearly spherical in shape, and have quite a feathery appearance.

Propagation.—Vigorous bulbs throw off numbers of offsets, and these, if carefully separated from the parent plants and potted separately, will grow into flowering bulbs in two or three years. The offsets should be removed just at the expiration of the period of rest.

Soil.—Sandy loam and fibrous peat in equal parts, with sand.

Other Cultural Points.—Potting should not be very firm, and drainage must be perfect. Plenty of water is required during the growing season, which may be made to coincide with our summer. Similarly the resting period may answer to our winter. Once in every three or four years is quite often enough to repot, but an annual top-dressing may be given with advantage.

Principal Species, Hybrids, and Variety :—

<i>abyssinicus</i> (<i>see</i> multi- florus).	<i>multiflorus</i> , 1', Ap., st., sc. (<i>syns.</i> <i>abyssinicus</i> and <i>Kalbreyeri</i>).
<i>cinnabarinus</i> , 1', Ap., st., red.	— <i>superbus</i> , improved form.
<i>coccineus</i> , 1' to 1½', Sep., sc.	<i>natalensis</i> , Feb., grh., flowers grn., bracts pur., anthers yel.; close to <i>insignis</i> , but finer.
<i>fascinator</i> , 1', spr., st., sc.; hybrid.	<i>Queen Alexandra</i> , 1', spr., st., or., sc.
<i>Kalbreyeri</i> (<i>see</i> multi- florus).	
<i>Katharine</i> , 1' to 1½', spr., warm grh., deep red.	
<i>mirabilis</i> , 1', spr., st., blush pk.; hybrid.	

Other Species :—

<i>albiflos</i> , 1', Jy., warm grh., wh. (<i>syn.</i> <i>vires-</i> <i>ceus</i>).	<i>magnificus</i> , warm grh., or., sc. (<i>syn.</i> <i>insignis</i>).
<i>albo-maculatus</i> , 6", Dec., warm grh., wh.	<i>Mannii</i> , 1', spr., st., crim., sc.
<i>deformis</i> , 3", Mch., warm grh., wh.	<i>puniceus</i> , 1', Je., grh., or., sc.
<i>hirsutus</i> , warm grh., wh.	<i>sanguineus</i> , grh., sc.
<i>insignis</i> (<i>see</i> <i>magnificus</i>).	<i>tigrinus</i> , 1', Ap., warm grh., crim.

HÆMARIA.

A small genus of terrestrial Orchids (*ord.* *Orchidaceæ*). Propagation, by cuttings, each taken with a piece of the root attached and kept close with bottom heat until they start into growth. Soil, two-thirds peat, one-third fibrous loam, and sand.

Principal Species :—

discolor, Nov., st., wh.

Heckeria (*see* *Humea*).

Hæmadietyon (*see* *Prestonia*).

HÆMATOXYLON. (THE CAMPEACHY WOOD.)

Stove evergreen trees (*ord.* *Leguminosæ*), unimportant from a decorative standpoint, but of great value economically. The principal species—*campechianum*, 20' to 40', yellow—yields the logwood of commerce, so much used by calico printers and dyers. The Logwood is furnished by the sapwood of the tree. Propagation, by cuttings of the ripened shoots, rooted in spring in sandy soil in heat. Soil, peat and sand.

HÆMODORUM. (BLOOD ROOT.)

Greenhouse perennials (*ord.* *Hæmodoraceæ*). They are of little value to British horticulture, but the roots are eaten as food by the aborigines of Australia. Propagation, by division of the root in spring. Soil, peat and loam, with a little grit.

Principal Species :—

<i>planifolium</i> , 2' to 3', Aug., livid pur., grn. at base, lower lvs. Grass-like.	<i>teretifolium</i> , like <i>plani-</i> <i>folium</i> ; lvs. shorter and cylindrical.
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HA-HA, or HAW-HAW.

A boundary fence placed below the ground line so as to afford the desired division without in any way obstructing the view. As a rule, the "ditch" forming the ha-ha is between 5' and 6' deep, one side being cut straight down, and bounded by a stout brick or stone wall. The other side may or may not present a surface sloping upwards and outwards.

HAKEA (*syn.* *CONCHIUM*).

Greenhouse evergreen shrubs or small trees (*ord.* *Proteaceæ*), more curious than pretty, and rarely seen outside botanic establishments. Propagation, by cuttings of the matured shoots under a bell-glass in spring. Soil, two parts peat and one part loam, with sand.

Principal Species :—

<i>cucullata</i> , 4', Je., red, lvs. small, milky grn. (<i>syns.</i> <i>conchifolia</i> and <i>Victoria</i>).	<i>nitida</i> , 6' to 8', Je., wh., lvs. prickly.
<i>dactyloides</i> , 7', Jy., wh. (<i>syn.</i> <i>Conchium dactyl-</i> <i>oides</i>).	<i>suaveolens</i> , 4', sum., wh., fragrant (<i>syn.</i> <i>pectin-</i> <i>ata</i>).

HALESIA. (SILVER BELL or SNOWDROP TREE.)

A small genus of hardy deciduous small trees, with very ornamental flowers (*ord.* *Styracæ*). They are seen at their best as specimens upon lawns, as their drooping flowers are then displayed to advantage. What pruning is necessary to keep them within bounds should be given after flowering is over. Propagation, by cuttings of the roots, taken in spring or autumn, dibbled into a cold frame, in sandy soil, and kept fairly close until they start; also by layers, cuttings of half-ripe wood, or seeds. Soil, sandy, friable loam. Plenty of moisture and a sheltered position are the conditions that *Halesias* best like; and if they are planted in naturally dry spots, such as the overdrained soil of a suburban garden, they must be kept well watered if they are to do even moderately well.

Hagberry (*see* *Cerasus Padus*).

Hag Taper (*see* *Verbasum Thapsus*).

Hair Grass (*see* *Aira*).

Principal Species :—

hispidula, wh. (*syn.* *Pterostyrax hispidum*).
tetraptera, 15' to 20', spr.,

early sum., wh.: re-
 sembling a Snowdrop
 (*see figure*).

Other Species :—

corymbosa, 10' to 20', Je.,
 wh. (*syn.* *Pterostyrax*
corymbosum).

diptera, 10', spr., wh.
 (*syn.* *reticulata*).
parviflora, 10', My., wh.
reticulata (*see diptera*).

cuttings taken in spring. Soil, equal parts of loam
 and leaf soil, with sand.

Principal Species :—

lucida, 4' to 6', Je. African Honeysuckle.

HAMAMELIS. (THE WITCH HAZEL.)

Hardy deciduous shrubs or small trees (*ord.*
Hamamelidæ). The flowers are showy, the plants



Photo: Cassell & Company, Ltd.

HALESIA TETRAPTERA.

HALIMODENDRON.

A hardy deciduous shrub (*ord.* *Leguminosæ*),
 with silky, silver-hued foliage. It does best grafted
 upon the common Laburnum, but may also be
 increased by seeds, cuttings, and layers in a cold
 frame. Soil, sandy loam.

Only Species :—

argenteum, 4' to 6', My., Jy., pur., lvs. hoary,
 feather shaped (*syn.* *Robinia Halimodendron* of
Botanical Magazine 1016).

HALLERIA.

Greenhouse evergreen shrubs (*ord.* *Scrophu-*
larinæ), ornamental, but rare. Propagation, by

Halimium (*see Cistus*).

bloom profusely and regularly, and the flowering
 season is winter and early spring, so that the Witch
 Hazels have much to commend them. As they are
 of slow growth, it is many years before they get
 too large for even small lawns. They do well in
 towns—another recommendation. Propagation, by
 layers and cuttings. Any rich, fairly light soil
 will suit.

Principal Species :—

arborea, 15' to 20', win.,
 petals bright yel., calyces
 rich claret (*syn.* *japonica*
 of *Botanical Magazine*
 6659).

japonica (*Sieb. and Zucc.*,
see p. 399) 6' to 9', win.,
 yel. *Zuccariniana* is a
 var. with pale yel. petals
 and greenish br. sepals.

Haltica (*see Turnip Enemies*).

mollis, 9', Feb., yel.
virginica, Oct., Feb., shr.,
yel. These seeds are edible

and furnish an oil. The
bark and lvs. have
astringent properties.

HARDENBERGIA.

Herbaceous or shrubby greenhouse climbers (*ord.* Leguminosæ). Propagation, by seeds, sown in gentle heat in spring, or, more commonly, by cuttings of the young lateral shoots, taken in April, and inserted in a warm propagating case. Soil, one part of loam, one part of peat, and one of dried cow or horse manure rubbed through a sieve, plenty of sand being added. The species named below flower early in the year, and thus a warm greenhouse temperature is desirable for them. They may be trained to cover the rafters or pillars of the conservatory, but some of the flowering shoots should be loosened and allowed to hang down, otherwise they present a rather stiff appearance. The plants may be grown in pots, but the best results are obtained when they are planted in prepared beds. Shade is required in the hottest weather.

Principal Species :—

comptoniana, Meh., pur.	monophylla, Ap., pur.
(<i>syns.</i> digitata, Huegelii,	(<i>syns.</i> cordata, ovata,
Lindleyi, makoyana,	Glycine bimaculata.
Glycine comptoniana,	Kennedy cordata, K.
and Kennedy macro-	longiracemosa, K. mono-
phylla).	phylla, and K. ovata).

HAREBELL.

The popular name of *Campanula rotundifolia*. The name Harebell is sometimes applied to *Scilla nutans*. Hairbell is an alternative spelling.

HARICOT.

The ripe seeds of several Beans (*Phaseolus*), chiefly of varieties of *P. vulgaris*, the Dwarf French Bean. They are more extensively grown on the Continent than in Great Britain, where they do not generally mature.

HARPALIMUM (see HELIANTHUS).

HARTOGIA (of LINNÆUS).

A nearly hardy evergreen shrub (*ord.* Celastrinæ), allied to Cassine. Propagation, by cuttings of the ripened shoots in sandy soil in a close frame. Soil, equal parts of peat and loam, with sand.

Principal Species :—

capensis, Je., grh., yel.

Hand Plant (see *Cheirostemon*).

Haplophyllum (see *Ruta*).

Hare's-car (see *Bupleurum*).

Hare's-foot (see *Ochroma Lagopus*).

Hare's-foot Fern (see *Davallia canariensis*).

Hare's-tail (see *Lagurus ovatus*).

Harina (see *Wallichia*).

Harrachia (see *Crossandra*).

Harrisonia (see *Marsdenia*).

Hartogia of Linnæus, *ord.* Rubiaceæ (see *Agathosma*).

Hart's-tongue Fern (see *Scolopendrium*).

Hassagay Tree (see *Curtisia faginea*).

Hastingsia (see *Holmskioldia*).

Hautbois or *Hautboy* (see *Fragaria* and *Straw berry*).

Hawkbit (see *Leontodon*).

Hawkbeard (see *Crepis*).

Hawkweed (see *Hieracium*).

HARTWEGIA.

Curious little epiphytal Orchids (*ord.* Orchidaceæ) requiring stove heat. Propagation, by division of the pseudo-bulbs. Equal parts of broken crocks, live sphagnum moss, and fibrous peat suit, and small pots or shallow pans only are necessary.

Principal Species :—

gemma, pur., blotched purpurea, 1', Aug., pur. vio.

HAWORTHIA.

Succulent plants (*ord.* Liliaceæ). The leaves of all the species are small and produced in rosettes. The flowers are also small and inconspicuous, being



HAMAMELIS JAPONICA (see p. 398).

green or dirty white in hue. They require a greenhouse temperature, and answer to the same general treatment as the Aloes, in which genus many of the species have figured. The list below is not an exhaustive one, but merely a selection of the best known.

Principal Species :—

albicans, lvs. 2½" to 3" long (*syn.* Aloe albicans of *Botanical Magazine* 1452).

arachnoides, lvs. 1½" to 2" long, grn. (*syn.* Aloe arachnoides of *Botanical Magazine* 756).

atrovirens, lvs. ½" long, dark grn. (*syn.* Aloe arachnoides pumila of *Botanical Magazine* 1361).

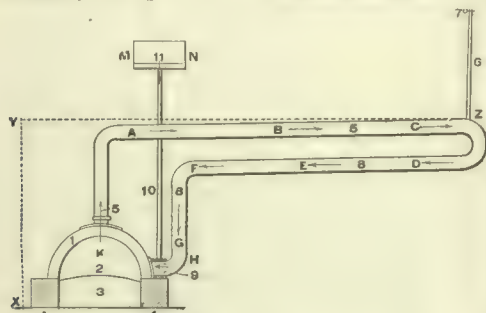
attenuata, lvs. 2½" to 3" long (*syn.* Aloe Radula of *Botanical Magazine* 1345).

cymbiformis, lvs. 1" to 1½" long, pale grn. fasciata, lvs. 1½" long, 1" broad, glaucous grn., spotted.

margaritifera, lvs. 2" to 3" long, warted (*syn.* Aloe margaritifera). There is a small growing var. named granata.

Reinwardtii, lvs. $1\frac{1}{2}$ " to 2" long, $\frac{1}{2}$ " broad.
retusa, lvs. 1" to $1\frac{1}{2}$ " long, $\frac{1}{2}$ " broad (syn. *Aloe retusa* of *Botanical Magazine* 455).
rigida, lvs. 1" to $1\frac{1}{2}$ " long, warted, br., red.
tortuosa, lvs. $1\frac{1}{2}$ " to 2"

long, dark grn., upper surface hollow (syn. *Aloe rigida* of *Botanical Magazine* 1337).
viscosa, lvs. 1" to $1\frac{1}{2}$ " long, upper surface much hollowed out, dark grn. (syn. *Aloe viscosa* of *Botanical Magazine* 814).



SYSTEM OF HOT WATER CIRCULATION.

- 1, boiler.
- 2, fire bars.
- 3, ash box.
- 4, brickwork.
- 5, 5, flow pipe.
- 6, air pipe.
- 7, tap.
- 8, 8, return pipe.
- 9, junction.
- 10, supply pipe.
- 11, cisterns.
- a, b, c, o, upward flow.
- d, e, f, g, h, downward flow.
- h, fuel space.
- m, n, level of water in cistern.
- x y, vertical line showing depth of water column.
- y z, horizontal line showing the rise of the pipes.

HAWTHORN.

The popular name of the flower of the Hawthorn, *Crataegus Oxyacantha*, and its varieties. Also called "May," in which month it usually appears in an ordinary season. (For culture, species, and varieties, see *CRATÆGUS*.)

HAZEL.

The popular name of the wild Nut, *Corylus Avellana*. (See *CORYLUS* and *NUTS*.) Hazel is much planted for covert purposes, being cut down at intervals of six or seven years. The cut-back stools soon break again, unless they are very roughly handled.

HEATH (see *ERICA*).

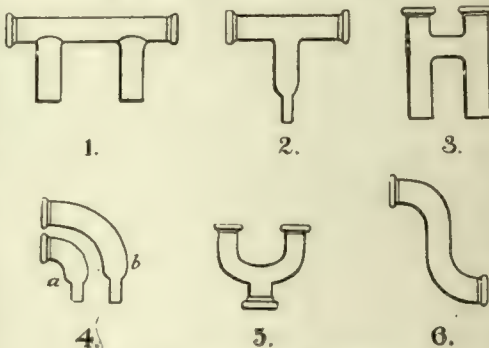
HEATING.

Much of the success that attends gardening operations under glass depends upon the efficiency or otherwise of the heating apparatus which may be in use. Briefly, the systems of artificial heating may be summed up as (1) by hot air, and (2) by hot water. To the former belong the antiquated system of heating by flues, now almost entirely discarded in favour of the newer and more scientific methods of heating by hot water; heating by

fermenting materials, as in the case of hotbeds, and of some propagating frames; and heating by oil and gas lamps, without the medium of water.

By Hot Water.—When we note that the artificial heat used in plant and fruit houses should be moist and equable, and not given to violent extremes, we see how excellent a medium hot water is, when conveyed by a proper system of piping, for keeping up the temperature of such houses when natural heat fails. The makes of boilers are almost innumerable, and include various methods of fixing the pipes, so that we have at the start a number of apparently totally distinct apparatuses. Yet all, from the big Duplex Upright Tubular, or Keith's Saddle, capable of driving 20,000' of 4" piping, to the little Independent boiler with scarcely 100' to its credit, work upon a common principle—the circulation of the water. The fire being lighted, the water lying close to the walls of the boiler begins to get warm, its specific gravity becomes less, the colder water, with the greater specific gravity, finds its level, and the warmer and lighter water is pushed upwards, the cold water taking its place. Thus it goes on as long as the fire is alight, a constant stream of cold water from the "return" pipes pushing upwards the warm water. In this way is set up the circulation of water, and if the apparatus is to be a success this circulation must be regular and constant. Any hitch or stoppage means cold pipes and frosted plants in one house, and perhaps a burst from over-pressure in another part. This is technically termed the "low pressure system of heating by hot water." There is also a "high pressure" system, but it is almost exclusively employed for the heating of dwelling houses and public buildings, and does not come within the scope of a gardening dictionary.

Boilers.—(See remarks under *BOILER*.) Generally speaking, cast iron boilers are more satisfactory than wrought iron ones, because greater uniformity in the thickness of the walls is obtained. More-



HOT WATER PIPE CONNECTIONS.

- 1, double T.
- 2, T piece.
- 3, H piece.
- 4, inside and outside elbow.
- 5, Y piece.
- 6, double elbow.

over, wrought iron heaters are liable to scale off in flakes and to wear unequally.

Gas and Oil Heaters.—Small hot water apparatuses are procurable, the heating medium of which is gas or oil, and they are much superior to the oil lamps which heat by hot air. Oil and gas have the advantage over coke and coal in that the

Hazel, Witch (see *Hamamelis*).

Heartsease (see *Viola tricolor*).

Heath, St. Dabeoc's (see *Daboëcia polifolia*).

Heath, Sea (see *Frankenia*).

Heather (see *Calluna vulgaris*).

Heathworts (see *Erica*).

supply may be automatically regulated, and a constant and regular heat thus ensured for any reasonable length of time without attention. It must be remembered, however, that the fumes given off by oil and gas in combustion are highly injurious to plant life. Elaborate precautions have to be taken, therefore, to bottle up, condense and burn, or get rid of these products of combustion. In some of these heaters the fumes are made to pass through a series of purifiers, and as long as these are in working order the plants in the house will take no harm. An exceedingly handy propagator in which cuttings of many tender plants may be speedily rooted may be heated by means of a small zinc tank of water standing over a lamp. If this propagator is placed inside the greenhouse, scrupulous care must be taken with the lamp to see that it is kept clean, or injurious fumes will be given off.

Pipes, Joints, and Fittings.—The 4" cast iron pipe, that is, a pipe with an inside diameter of 4", is the one generally in use, except it be for large mains and connections, where 6" pipes are occasionally employed. The pipes are generally made in 9' lengths, with one plain and one socket end, for fitting. Wrought iron pipes are rarely seen in the low pressure system. The pipe which conveys the hot water from the boiler is technically known as the "flow," and the one which takes the cold water back again as the "return," pipe. There may be several "flows" and several "returns," according to the size of the house. The "flow" pipe is generally the upper, and the "return" pipe the lower, and in laying them down a rise of $\frac{3}{4}$ " to $\frac{1}{2}$ " per 9' run is usually allowed, as this facilitates ease of working. At the highest part of the apparatus there should be a tap or an automatic air vent in the shape of a small tube let into the pipe and curved at the top to keep out dirt. Air is apt to collect in the pipes, and unless given vent will impede or even prevent the circulation of the water. This is technically known as "air locking."

Top Heating.—As a rule, pipes are laid down close to the floor of the house, following the principle that the hot air is pushed up by the cold, or, as it is commonly phrased, rises. Of late years, however, the practice of running a row of pipes—usually 3"—round under the eaves of the house has come into vogue. It has been tried in the Palm House at Kew with excellent results, and has been found to prevent a good deal of the drip that is so great an evil in winter.

Amount of Piping.—In all cases it is much safer to have too much piping in a house than too little. At least enough must be provided to keep up the requisite temperature without causing the house to smell of fire heat. To calculate the quantity of piping required for any house, Tredgold enunciates the following rule: "To the length of the hothouse, multiplied by half the vertical height, add one and a half times the whole area of glass, and also eleven times the number of doors. The sum will be the number of cubic feet to be heated per minute from the temperature of the external air to that of the house. Then multiply the cubic feet of air to be heated per minute by the number of degrees the house is to be warmed, and the result, divided by twice the difference between the temperature of the house and that of the surface of the pipes, will be the feet super. of pipe required." One foot run of 4" piping gives about 1' square of heating surface, since the diameter is to the circumference of a cylinder as 1 is to 3.1416,

etc. The fractions may be ignored for a rough calculation. A good practical method for finding the amount of piping required is to divide the cubic area of the house by thirty for cool houses, by twenty-five for intermediate houses, by twenty for plant stoves, and by fifteen for houses in which hard and early forcing is to be done.

Making Joints.—Various methods of making the joints are in vogue. Packing with red lead and tow has an advantage over packing with hemp and iron filings, in that it is to a slight extent elastic, and great pressure does not so often mean a burst joint. The most scientific method is, however, the elastic joint, which, briefly, is a rubber ring compressed over the joint by iron collars fastened by bolts and screws. Fitting by these joints is also more speedy than in any other way. Portland cement is excellent for stopping a leaking joint. Of the valves in use, the screw valve is better than the half-turn valve, in that it gives a greater command over the flow of water.

Fuel.—(See COAL and COKE.)

Stoking.—A small body of bright fire, free from ashes and clinkers, will give off more heat than one double the size that is choked up with dirt. Cleanliness is the secret of good stoking, and with this should be combined an intelligent use of the draught dampers. It is much better to trust to these when making up the fire the last thing at night than to throw on quantities of ashes, as is so frequently done.

HECHTIA.

Handsome and distinguished looking plants (*ord.* Bromeliaceæ), usually to be seen amongst collections of succulents. The leaves of all the species are long, narrow, recurving, and possessed of sharp teeth. The plants may be increased by offsets, which are occasionally produced by old plants. They should be firmly potted, singly, in small pots in very sandy soil, with plenty of drainage. Older plants like fibrous loam three parts, cow manure one part, crushed crocks one part, and rough sand one-sixth of the whole. Less water is required than for the majority of plants, and very little indeed should be given in the winter.

Principal Species:—

argentea, lvs. $1\frac{1}{2}$ ' to 2' long in a dense tuft or rosette, silvery.

Other Species:—

<i>glomerata</i> , lvs. silver on lower surface, gm. on upper (<i>syn.</i> <i>Ghiesbreghtii</i>).	<i>stenopetala</i> , lvs. with strong triangular spines (<i>syn.</i> <i>cordylinoides</i>).
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HEDERA. (IVY.)

Description.—A small genus (*ord.* Araliaceæ) with regard to species, there being only three, but a large one when the immense number of varieties is taken into account. *Hedera Helix*, the common Ivy, is perhaps the most important of all the climbing plants that are hardy in this climate. It is distributed naturally over the northern hemisphere, and there are few subjects that exhibit so much capacity of adaptation to circumstances. The Ivy has been cultivated for years, and under cultivation has given rise to hundreds of varieties, of which a selection is given on pp. 402, 403. Some of the stronger-growing climbers, such as the type itself, the Irish Ivy (*canariensis*), *dentata*,

Hebeclinium (see *Eupatorium*),

Hedera (see *Darwinia*).

purpurea, and *rægneriana*, are strong-growing climbers that will succeed in almost any soil and in any aspect. The bleaker the position, the more



Photo: Cassell & Company, Ltd.

HEDERA HELIX MACRODONTA (see p. 403).

of that exquisite bronze purple does the foliage put on, and the hardier the plants seem to grow. The smaller-leaved forms, such as *donerailensis*, *gracilis*, *marmorata minor*, and *conglomerata* may be utilised upon the rockery, for training up trellises as pot plants to form window and fire screens, and for furnishing tree stumps. Highly artistic results may be obtained with very little trouble by planting such varieties as these close to, and allowing them to ramble over, rough tree stumps. The Tree Ivies are a host in themselves, for they alone count their varieties by the score. To those who may be inclined to ask why the Tree Ivy, so distinct in appearance from the ordinary climbing Irish Ivy, is yet referred to the same species, *Helix*, by botanists, it may be well to point out that the Tree Ivy is the form that the ordinary climbing Ivy takes on when it has run beyond its supports and has nothing to cling to. These shrubby tops may, if desired, be taken off and rooted, and they will preserve their shrubby character.

Propagation.—Cuttings of fairly firm, healthy shoots may be taken in autumn, and dibbled into a firmly made up bed of sandy soil in a cold frame. Little water will be needed during the winter months, and by spring time these cuttings will have rooted. Grafting is also common, especially with the "Trees." Vigorous growing forms are employed as stocks. Grafted plants usually move more briskly than cuttings.

Soil.—Ivy will grow in almost any medium, however poverty-stricken it may be, but, naturally, the best results are forthcoming when good soil is used.

Other Cultural Points.—A prejudice long existed against Ivy as a climber for house walls. It was declared that it made the walls damp, that the aerial roots pushed themselves in between the brick chinks and loosened the bricks, and that it

harboured dust and vermin. The truth is that Ivy-covered walls are not damper than any other walls, but drier, and that the aerial roots are really only supports and not true roots, and their function the mechanical support of the plant only. They may excrete a little acid, which corrodes the face of the mortar, and thus gives them a better hold, but practically their disintegrating influence upon brickwork is nil. The last of the charges, that Ivy harbours dust and vermin, will prove to be true unless the annual clipping is strictly adhered to. An ordinary reaping hook is the best tool, and spring—April—the most suitable time. The straggling growths and most of the old leaves should be chopped off quite close. The stems may look bare for a few weeks, but they will soon break into healthy young growth, and in the meantime most of the dust and the vermin have been got rid of with the old leaves. Tree Ivies need plenty of water at all times, and weak doses of soot water once a week will be greatly relished. Once a week should not, however, be exceeded with the variegated sorts, or they will lose some of their variegation.



Photo: Cassell & Company, Ltd.

HEDERA HELIX MARGINATA AUREA (see p. 403).

Principal Species and Varieties:—

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| australianna, lvs. grn. | foliage (see separate list of Tree Ivies). |
| <i>Helix</i> . Common Ivy. A selection of the best vars. is given herewith. The colours apply to the foliage. | — <i>aurantia</i> , greyish grn., veined. |
| — <i>algeriensis</i> , yel., grn. (<i>syn.</i> <i>viridis</i>). The variegated form is pretty (<i>syn.</i> <i>canescens</i>). | * — <i>canariensis</i> . Irish Ivy. Deep grn., large, five-lobed (<i>syn.</i> <i>grandifolia</i>). Variegated sub-var. |
| — <i>arborescens</i> . The Tree Ivy. Great var. of form and colour in the | — <i>chrysocarpa</i> , greyish grn. |
| | * — <i>conglomerata</i> , greyish grn., small, slow |

- growing, stubby; suitable for rockwork.
- *cuspidata* minor, deep grn., wh. veins, leaf stalks pur.
 - *deltoidea*, dark grn., stem pur.
 - *dentata*, large, heart-shaped lvs., dark grn.
 - *digitata*, dark grn., wh. ribs. *Caenwoodiana* is close to this.
 - * — *donerailensis*, pur. br. in win., bronze grn. in sum.; pots and rockery.
 - *Glymii*, grn., wedge shaped; pots.
 - *gracilis*, deep grn., bronze grn. in win.; walls and tree stumps.
 - *lobata* major, deep grn.
 - *lucida*, small, grn., wh. veins; walls and tree stumps.
 - *macrodonata* (see p. 102).
 - *marginata*, triangular, small, grn., margined silver; rockery.
 - *marginata aurea*, margined or. yel., turning to red; walls or rockery (see p. 102).
 - *marginata* minor, lvs. smaller than type; pots (*syn.* *Cavendishii*).
 - *rubra*, red margin; pots or rockery (*syn.* *elegantissima* and *tricolor*).
 - *marmorata*, grn., marbled cream wh.; walls and stumps.
 - *marmorata* minor, smaller lvs., more constant variegation.
 - *palmata*, deep grn.; walls and stumps; slow grower.
 - *purpurea*, a pur. leaved form of *regneriana*.
 - * — *regneriana*, large, dark grn., heart shaped.
 - * — *rhombea*, medium, grn., margined wh. (see figure).
 - *sagittifolia*, deep grn., bronze grn. in win.
 - *scutifolia*, dull grn. (*syn.* *cordata*).
 - * — *variegata*, grn., margined silver; walls or stumps.
 - *willseana*, very dark grn.; walls or stumps.

* Select for six varieties.

A Selection of Tree Ivies:—

- acuta* (*amurensis*), grn., large lvs. of *dentata* type.
- alba marginata*, silver, grn., the hardest of the small-leaved, variegated vars.



Photo: Cassell & Company, Ltd.

HEDERA HELIX MINIMA.



Photo: Cassell & Company, Ltd.

HEDERA HELIX RHOMBEA.

- algeriensis* variegata, silver, grn.
- arborescens* marginata, margined silver, very hardy.
- baccifera* lutea, berries yel., good habit.
- canariensis* aurea maculata, a golden spotted Irish Ivy.
- *latimaculata*, silver spotted.
- conglomerata*, grn., small and close-growing.
- dentata*, Giant Ivy, very large lvs.
- digitata*, pale grn., grey veins.
- *aurea*, yel. var.
- elegantissima*, Russell's var., margined creamy wh.
- flavescens*, best small-leaved golden var.
- Glymii*, pale grn., bronzy in aut.
- maderensis* variegata, largest silver var.
- minima*, good for rockeries (see figure).
- nigra*, pur. blk.
- palmata* aurea, golden.
- regneriana*, heart shaped, grn.
- rubra* marginata, pk., silver, robust.
- Russell's var., like *conglomerata*.
- spectabilis* aurea, one of best of gold blotched vars., very hdy.

HEDGES.

When properly planted and looked after, hedges are objects of beauty; when allowed to run wild they are very much the reverse. The size and character of the hedge will depend (1) upon the purpose it is intended to serve, (2) its position, and (3) the soil and weather conditions of the locality. For ordinary boundary purposes, especially when one side of the hedge is turned to a public thoroughfare, there is nothing better than Whitethorn, or "Quick." Holly makes a good protective hedge, but it is inferior to Quick in that cattle will eat the young shoots. A mixture of Quick and Beech forms, perhaps, the thickest and most serviceable hedge. If cut in annually, it will last for years before it begins to get bare at the bottom.

Amongst Conifers, *Capressus lawsoniana* makes an elegant hedge plant, but it must be headed back at an early stage, or it will soon grow out of bounds. Box, Laurel, and Yew are all available for evergreen hedges, and Box especially is to be recommended. Yew is open to the objection that it is poisonous, and Laurel that severe winters will sometimes cause ugly gaps in it. For dividing portions of the garden from each

Hedgehog Thistle (see *Echinocactus*).

Hedge Hyssop (see *Gratiola*).

Hedge Mustard (see *Erysimum* and *Sisymbrium*).

other, Box and Holly easily take first place amongst evergreens. Holly especially is noteworthy, because it can be raised easily from seeds or cuttings, transplants readily (the best months for the work being April and September), quickly grows to the height required, does not soon become bare at the bottom, and is at all times bright and pleasing. Other subjects that may be employed, either by themselves or in mixture with something else, are Golden and Green Privet (*Ligustrum ovalifolium* is a great favourite), Viburnum Lantana, and Oak. Division hedges may run from 4' to 6' in height.

Miniature hedges—6" to 8" high—are sometimes employed as permanent edgings to beds in the flower garden. There is no more suitable subject for this kind of work than *Euonymus radicans variegatus*. The ordinary Box edging is really a miniature hedge. (See EDGINGS.)

Shelter hedges need to be of a considerable height—say anything from 6' to 12'. The Myrobalan, or Cherry Plum (*Prunus Myrobalana*), and the Hornbeam make capital shelter hedges. Both grow quickly, and an annual pruning is all that is necessary to keep them in condition. Although deciduous, the Hornbeam carries many of its old leaves until they are pushed off by the young ones in spring, and thus forms an almost perfect wind-break.

A row of Lombardy Poplars, which may be headed back when they reach the required height, makes a shelter hedge more quickly than any other subject, and in very bleak spots it is well worth while to plant them for temporary shelter whilst the permanent hedge is growing.

Planting and Protecting.—Seeing that hedge plants have to be on the ground for many years, the site selected should be well dressed with manure and trenched prior to planting. The actual site of the hedge may, if desired, be raised a foot or so, and a ditch may be dug on the outer side of it. Planting in double rows, the plants in the one row alternating with those in the other, is to be recommended. The plants may be 1' apart if there is only a single row, 18" and alternating if there are two rows. A wooden paling or a light strained wire fence will be a necessary protection for three or four years after planting, or until the hedge becomes thick enough to protect itself.

Pruning and Clipping.—For Quick, Yew, Box, Hornbeam, and Holly hedges, a pair of hand shears, such as those used for clipping grass verges, is the best instrument to use. For Laurel, Viburnum, and, in fact, all large-leaved subjects, the shears must not be used, as they mutilate the leaves too much. Careful pruning with the knife must be given. The hedge should be shaped so that its greatest diameter is about 2' from the ground, and from that point upward it may gradually taper inwards, the top being either cut flat or rounded off. Clipping should be done after the summer shoot makes its appearance, that is, from the middle of June to the end of July. If the shears or knife are used too soon, a second application towards the close of the summer may be necessary. Holly and Yew hedges are best done early in September.

The Treatment of Young Hedges.—Young White-thorn plants should be cut hard back the first year, and for the next two or three years the pruning must be rather hard, so as to ensure the bottom being furnished with shoots. In the fourth and fifth years it is better to give two moderate prunings instead of one severe dressing, and this

treatment should be continued until the hedge has reached its desired size.

Repairing Faulty Hedges.—Where hedges have become very gappy it is often economical to root up the remains and plant afresh. Hedges of Laurel, Yew, Privet, and Holly that have become too tall and straggling may be brought within bounds by cutting them hard back to the old wood, and allowing them to break afresh. Where the cutting-back is very severe it will be wise to do one side at a time.

HEDWIGIA.

Four or five species of tropical trees (*ord.* Burseraceæ), unimportant from a garden point of view, but of some economic value, as they yield a resinous exudation of balsamic properties. Propagation, by ripened cuttings in sandy soil, in brisk bottom heat. Soil, sandy loam three parts, peat or leaf mould one part, and sand one-sixth.

Principal Species :—

panamensis, 60', wh. (*syn.* balsamifera).

HEDYCHYUM.

Tropical herbaceous plants (*ord.* Scitamineæ), with huge terminal trusses of bright, usually fragrant flowers, and broad, handsome leaves. Very few of the species are grown; three only are to be found in general cultivation, and of these three *gardnerianum* is the favourite. All the plants revel in plenty of heat, although some of them, *gardnerianum* and *flavosum* to wit, are very nearly hardy. With regard to moisture, they are almost sub-aquatics, for they never do better than when their tubs or pots are standing in water—that is, during the growing season. In winter little if any water is required, and the crowns of *gardnerianum* may be shaken out of the soil and stored like those of Dahlias or Cannas.

Propagation.—By division of the rootstocks in spring prior to the starting away of growth. The crowns may be cut up with a knife or a sharp spade, each division with an eye or two, and plunged in a bed of Coconut fibre refuse or sandy soil over bottom heat in a warm house. Once the divisions have started to grow they may be treated in much the same way as Cannas.

Soil.—Equal parts of loam, leaf soil, and spent Mushroom bed manure, with sand. Potting should be only moderately firm.

Principal Species :—

coronarium, 5', My., Jy., st., wh.; fragrant.	<i>gardnerianum</i> , 3' to 5', sum., st. or grh., lemon
—flavum, 3', Jy., st. or grh., or; fragrant.	yel.; fragrant. Nearly hdy. in south-west of England.
Nearly hdy. in Cornwall and Devon.	

Other Species and Varieties :—

carneum, 3' to 4', Aug., st., flesh pk.	yel.; fragrant (<i>syn.</i> flavum of <i>Botanical Magazine</i> 2378).
coccineum, 3' to 6', Je., st., deep red.	gracile, 2' to 3', Sep., st., wh.
coronarium chrysoleucum, 5', Aug., st., wh., or, blotched lip; fragrant.	spicatum, 3', Oct., st., yel.
flavosum, 2' to 3', Jy., st.,	—acuminatum, 3' to 5', Oct., st., yel., wh.; fragrant.

HEDYSARUM.

A large genus of hardy perennial herbs and subshrubs (*ord.* Leguminosæ), many of which are of elegant habit and have showy flowers. They are, however, with the exception of *coronarium* and *multijugum*, not at all popular subjects with the

majority of gardeners, although they are hardy, easy to grow and propagate, and thrive in almost any soil, no matter how poverty stricken it may be. Propagation is usually effected by seeds, which in most seasons are produced freely; also by root division. To get the best flowers the soil should be rich, and the position a sunny one. All the species named below are hardy.

Principal Species :

coronarium, French multijugum, 2' to 5', sum.,
Honeysuckle, 3' to 4', shr., red, pur.
sum., herb. per., rich
red.

Other Species :—

Crista-galli (see Onobrychis sativa).
Mackenii, sum., herbaceous per., red.
microcalyx, Je., sub-shr., vio., red.
obscurum, 6'', sum., herbaceous per., pur.
Onobrychis (correctly Onobrychis sativa).
sibiricum, 4', Je., Jy., herbaceous per., pur. (syn. alpinum of Botanical Magazine 888).
tuberosum (see Pueraria tuberosa).

HEDYSCEPE.

A handsome stove Palm (*ord.* Palmæ) of tall and stately habit. It thrives under the same conditions as do the Kentias. It needs a roomy stove to display its beauty to advantage. The only species is *canterburyana*, 32', rich green, which is better known as *Kentia canterburyana*.

HEERIA.

A small genus of herbs and semi-shrubby stove plants (*ord.* Melastomacæ). Some of them are very beautiful, but as yet they are rare in cultivation. Propagation, by cuttings taken in February and March, and rooted in a close propagating frame. Soil, equal parts of sandy loam and peat.

Principal Species :—

rosea, 1' to 1½', st., aut., win., ev. sub-shr., ro.
May be grown outdoors in sum., makes a handsome winter flowering plant.

HEINSIA.

Tropical African evergreen shrubs (*ord.* Rubiacæ), requiring a stove temperature, but rarely cultivated.

HEISTERIA. {PARTRIDGE PEA.}

A small genus of stove trees and shrubs (*ord.* Olacinæ), with small flowers and leathery leaves. Cuttings of ripened wood will root in sand if given a brisk bottom heat. Soil, loam, peat, and sand in equal parts. Pot firmly.

Principal Species :—

coccinea, 15', win., st., wh., calyx dark pur

HELENIUM.

Hardy ornamental annuals and perennials (*ord.* Compositæ). The plants grown in gardens are chiefly perennials, and even they display a good deal of variety with regard to habit. Some of the species, notably *autumnale* and its varieties, are very useful for supplying cut flowers, and are grown in quantities for that purpose. Propagation, by seeds, sown in spring or when ripe, on a sheltered border out of doors; or by division of the roots in

spring—the latter method for all the perennials. Any fairly good garden soil will do.

Principal Species and Varieties :—

autumnale, 4' to 6', late sum., aut., per., yel. a capital edging for herbaceous borders (see figure).
— *commutatum*.
— *grandiflorum*.
— *pumilum*, 10'' to 12'',
— *striatum*, streaked br.

Other Species :—

Bigelovii, 4', late sum., yel., br. disc.
Bolanderi, 1' to 1½', Je., Aug., yel., br. disc.
Hoopesii, 2½', sum., per., yel.
nudiflorum, 2½' to 3', sum., aut., per., yel.
— *atropurpureum*, dark pur.
puberulum (syn. *californicum*).
quadridentatum, My., Oct., ann. or bien., yel.
setigerum, 1', sum., ann., yel. (syn. *Amblyolepis setigerum*).

HELIANTHELLA.

Small, Sunflower-like, hardy or half-hardy perennial herbaceous plants (*ord.* Compositæ) of value for the mixed border. They are propagated by seeds or division, and grow in common soil, in a sunny or half-shaded position. *Quinquenervis* is valued for its early-blooming qualities.

Principal Species :—

californica, 2', Je., Jy., hlf-hdy., yel.
quinquenervis, 2', Je., Jy., hdy., yel.
uniflora, 2', Je., Jy., hdy., yel.



HELIANTHEMUM AUTUMNALE PUMILUM.

HELIANTHEMUM. (SUN ROSE.)

Beautiful, hardy, annual or perennial, herbaceous or sub-shrubby plants (*ord.* Cistineæ), principally of trailing growth and of great value for rockwork or for dry, sunny banks. The nomenclature of the genus is very much confused. Propagation, by seeds, the perennials also by cuttings under a hand-light or in a frame. Soil, light and sandy. *Helianthemums* do not transplant well when large, and young plants should always be chosen unless turned

Heimca (see *Nesaea*).

Heintzia (see *Alloplectus*).

Heleia (see *Trichopilia*).

out of a pot with the ball of soil intact. They should always have full sun, but as the blossoms are very fleeting they ought not to be planted where flowers are required in the afternoon. They may also be grown on rather flat roofs with about 4" of soil.

Principal Species and Varieties :—

formosum, 4', Je., yel.
(*syn.* *Cistus formosus*).
occymoides, 2', Je., yel.;
several vars., such as *algarvense* and *candidum*.
polifolium, 1', Je., wh.,
drooping,
— *roseum*, ro.
vulgare, Je., yel., trailing.
A very variable species, from which most of our garden *Helianthemums* have come. Many colours. Seedlings give good flowers, but two of the

best of the doubles are that called *amabile* or *mutabile* fl. pl., sc., and its yel. sport *Jubilee*. Others are *Mrs. C. W. Earle*, *hyssopifolium*, *macranthum*, and *mutabile*. For other named *Helianthemums* consult nurserymen's catalogues, but *croceum*, *Fireball*, *Golden Queen*, *Innocence*, *Pink Beauty*, and *Sulphur Gem* would make a good selection of singles.

principally adapted for large borders, or for wild gardens, especially those which are of rambling habit at the root, such as *H. rigidus* and its forms. These may be confined at the root, but in that case require good feeding.

Propagation.—The perennials by seeds sown under glass in spring or summer, or by division of the roots in autumn or spring. The annuals by seeds sown early in spring in a hotbed under glass, and pricked off into small pots, to be planted out in May; or sown in April or May where they are to bloom.

Soil.—The *Helianthuses* like a rich, well dug soil, with plenty of decayed manure beneath.

Other Cultural Points.—The Sunflowers ought never to suffer from drought when growing, and the tall forms of *H. annuus*, the Common (annual) Sunflower, must have good treatment if wanted of imposing dimensions. The perennial species also respond to good treatment, and all should be properly staked in good time.



Photo: Cassell & Company, Ltd.

HELIANTHUS RIGIDUS (see p. 407).

Other Species :—

[All yellow, if not otherwise described.]

alyssoides, 6'', Je.
— *cheiranthoides*, 6'', Je.
canadense, 1', Je.
canum, 9'', Je.
carolinianum, 1', Jy.
ciliatum, 9'', Je., red.
cinereum, 1', Jy.
crassifolium, 1', Je.
dichotomum, 9'', Je.
glaucom, 2', Jy.
guttatum, 6'', Je.
halimifolium, 3', Jy.
hirtum, 1', Je.
italicum, 1', Jy.
— *clandicum*, 9'', Jy.
lavandulæfolium, 1', Je.
Libanotis, 1', Jy., (*syn.* *rosmarinifolium*).
organifolium, 1', Jy.
(*syn.* *marifolium*).
procumbens, 6'', Je.
pulverulentum, 9'', Je.,
wh. (*syn.* *appenninum*,
Weiss).
roseum, 6'', Je., pk.
thymifolium, 1½', Jy.

HELIANTHUS. (SUNFLOWER.)

Description.—Showy, hardy or half-hardy, annual or herbaceous plants (*ord.* *Compositæ*). They are

Principal Species and Varieties :—

annuus, Common Sunflower, 6', sum., ann., yel. Many forms. The seeds are used for poultry food, and the crushed seeds yield oil. *Californicus plenissimus* and *globosus fistulosus* are good double vars.; good singles are *giganteus*, *Henry Wilde*, *macrophyllus*, *Munstead*, *Primrose*, *Primrose Dame*, and *uniflorus*.
cucumerifolius, 3½', sum., ann., yel. A beautiful species with smaller flowers. Several new vars. have been raised;
Stella, which has twisted "petals," is pretty. Some authorities make *cucumerifolius* a var. of *debilis*.
decapetalus, 6', Jy., per., yel.; flowers small, spreads quickly.
multiflorus, 4', Jy., yel.: a fine species, surpassed, however, by the var. *maximus*, 6', with larger flowers. *Flore pleno* is a good double form, and others with double flowers are *Bouquet d'Or* and *Soleil d'Or*.
orgyalis, 6', Aug., yel.;

very ornamental foliage, but blooms late.
rigidus, 5', Aug., yel. (*syn.* *Harpalum rigidum*); of running habit and spreads quickly (*see p. 406*). Miss Mellich and

Other Species :—

[All yellow, unless otherwise described.]

angustifolius, 2½', Sep.
argophyllus, 5', sum., ann., foliage silvery.
divaricatus, 5', Aug.
doronicoides, 6', Aug.
giganteus, 10', Aug.
grosse-serratus, 9', Aug.
latiflorus, 5', Aug.
laevigatus, 5', Aug.
Maximiliani, 3' to 10', Aug.

Daniel Dewar are fine forms of this.
tuberosus, Jerusalem
Artichoke, 6' to 10', Sep., yel. (*see Artichoke*).

mollis, 4', Aug.
Nuttallii, 4', Aug.
occidentalis, 3', Aug.
parviflorus, 5', Jy. (*syn.* *microcephalus*).
pumilus, 3', Aug.
strumosus, 6', Jy.
tomentosus, 4' to 10', Aug.
trachelifolius, 5', Aug.

HELICHRYSUM (*syn.* ELICHRYSUM).

EVERLASTINGS.

Description.—There are upwards of 260 species within the confines of this genus (*ord.* *Compositæ*), and they comprise greenhouse and hardy, shrubby, and herbaceous subjects. Of this large number, however, very few are grown, and in most cases the cultivator's knowledge of the *Helichrysums* is limited to the annual bracteatum and its varieties, and arenarium, which furnish the Immortelles. These, by reason of the great lasting properties that the flowers have when dried, as well as by their bright and varied hues and ease of culture, have become very popular.

Propagation.—The greenhouse and half-hardy perennials may all be raised from cuttings rooted in very sandy peat in a gentle heat in spring. Bracteatum and the other annual forms may be obtained in quantity from seed sown under glass at the beginning of March in a temperature of about 55°.

Soil.—A good loam, lightened a little with leaf mould and sand, forms a capital medium for outdoor *Helichrysums*; the greenhouse shrubby species require sandy peat.

Other Cultural Points.—Cut the flowers before they are fully open—that is, just as the buds begin to colour, and before they have opened sufficiently to show the yellow central disc. Fully expanded flowers turn black in the centre when dry. Lay the stems upon some flat surface to dry, so that they may dry straight and stiff. (*See EVERLASTINGS.*)

Principal Species and Varieties :—

arenarium, Yellow Everlasting, 6" to 12", sum., hdy. per., yel.
bracteatum, 3' to 4', Aug., hlf-hdy. ann., colours various. Many vars., of which *acuminatum*, *chrysanthum*, and *macrocephalum* are some of the most distinct. Other good ones are *aureum*, yel.; *bicolor*, yel.; *compositum*,

double, various; *macranthum*, wh., ro.; *niveum*, wh., large, solitary.

humile, the correct name of *Aphelexis humilis*, which *see* (*syn.* *Helipterum humile*).
sesamoides, 1' to 2', various (*syns.* *Aphelexis* and *Helipterum sesamoides*, several vars.)

Other Species :—

bupthalamoides (*see scorpioides*).
ericifolium, 1½', Meh., Aug., grh. shr., pale pk. (*syn.* *Gnaphalium ericoides*).

felinum, 3', My., Je., grh. shr., pur. (*syn.* *Gnaphalium congestum* of *Botanical Magazine* 243).
fetidum, 2', Je., Sep.,

grh. yel. (*syn.* *Gnaphalium fetidum* of *Botanical Magazine* 1987).

— *Mannii*, 2' to 3', Sep., grh., wh.
frigidum, 3", My., hlf-hdy., wh.
grandiflorum, 3', Je., Aug., grh. sub-shr., wh. (*syn.* *Gnaphalium grandiflorum*).

gunnianum (*see scorpioides*).

plicatum, hdy. herbaceous, wh.; lvs. greyish wh.; good for covering stony banks.

scorpioides, 1', grh. herbaceous per., yel. (*syn.* *bupthalamoides* and *gunnianum*).

Stechas, 1', sum., hdy. ev. sub-shr., yel.

HELICODICEROS.

A curious hardy perennial herb (*ord.* *Aroidæ*), with a perennial rootstock. Propagation, by root division. It likes a light, rich soil. Where it is planted in localities visited by long and severe winters, a little covering is advisable.

Only Species :—

crinitus, 1' to 1½', Ap., spathe dark pur. br. (*syn.* *Arum crinitum*).

HELICONIA.

Handsome stove foliage plants (*ord.* *Scitamineæ*), closely allied to the Musas, and, like them, delighting in plenty of heat and moisture. Heliconias are usually only met with in botanic gardens, and this is a pity, considering their beauty, and the ease with which they can be grown. Propagation, by division of the rootstock in spring, just before growth commences. Each division should be potted rather loosely in sandy soil, and the pot plunged to the rim in Cocoanut fibre refuse in a propagating frame. Soil, equal parts of loam, leaf mould, and well rotted cow manure, with sand. Give plenty of water and liquid manure during the summer, but withhold water when they are at rest in the winter. Shade from hot sun is necessary, as the leaves, substantial as they appear, soon burn.

Principal Species and Varieties :—

aureo-striata, 3' to 5', grn., yel. veins, stems striped grn., yel.
Bihai triumphans, grn., blk., br. stripes.
illustris, 3' to 5', grn., red veins.

— *rubricaulis*, 2' to 5', yel., car. stems car.
psittacorum, 8', Aug., or., lvs. grn.
Sanderi, much like *illustris*, but differently variegated, and not quite so strong.

Other Species :—

aurantiaca, 3', sum., flowers wh., spathes or. red (*syn.* *brevispatha*).
Bihai, 12', Jy., Aug., or. red.

humilis, wh., grn.
metallica, lvs. grn., bronze red.
vinosa, lvs. grn. above, pur. below.

HELICOPHYLLUM.

Greenhouse or hardy herbs (*ord.* *Aroidæ*), with tuberous rootstocks. *Alberti*, which is much like an *Arum* in habit, is the only species that is generally grown. It does well on a sheltered south or west border, but in cold localities should be covered with a few inches of dry litter in the winter. It may be increased from the tuberous offsets which make their appearance at the side of the main rootstock.

Principal Species :—

Alberti, hdy., My., spathe 7" long, dark maroon pur., spadix tipped bluish blk., flower fœtid.

Helichroa (*see Rudbeckia*).

Helicodes (*see Billbergia*).

HELINUS.

A small genus of climbing shrubs (*ord.* Rhamneæ), with slender, angular branches. Propagation, by seeds, or cuttings of the half ripened shoots. Soil, good loam, with a little leaf mould and sand.

Principal Species :—

ovatus, warm grh., grn.

HELIOCARPUS. (SUN FRUIT.)

Tropical American trees and shrubs (*ord.* Tiliaceæ), of little value.

HELIOPHILA.

Half-hardy annual herbs and sub-shrubs and a perennial climber (*ord.* Crucifereæ). Propagation, by seeds of the annuals. Any light, well worked garden soil will suit.

Principal Species :—

amplexicaulis, 9", Je., scandens, 12', win., grh.,
Sep., wh. to pur. cl., wh., sweet.

Other Species :—

coronopifolia, 1' to 2', bl. (*syn.* stricta of Botanical Magazine 2526).
Je., Sep., bl., vio. — incisa (*syn.* araboides of Botanical Magazine
crithmifolia, 6", Jy., ann., —
vio. of Botanical Magazine
pilosa, 6" to 12", Je., Jy., 496).

HELIOPSIS.

A small species of hardy annuals and perennial herbs (*ord.* Compositæ). The perennials are the ones generally to be seen; the annuals are rare, if indeed they are in cultivation at all. The plants answer to the same cultural treatment as the Helianthus, including increase by division and by seed. Any ordinary garden soil will do, but they like plenty of sun.

Principal Species and Varieties :—

lævis, 3' to 6', aut., yel. — pitcheriana, or.
— scabra, 2' to 4', Aug.,
yel., rough foliage.

HELIOTROPIUM. (HELIOTROPE.)

Description.—Upwards of 150 species (*ord.* Boraginæ) have been described, although the claims of many to rank as species are vague. The genus is chiefly represented in gardens by the varieties of the fragrant peruvianum, or Cherry Pie, as it is commonly called. Heliotropes are very tender subjects, and, although they may be grown in the greenhouse or outdoors during the summer months, the greenhouse is scarcely warm enough for them in winter.

Propagation.—By cuttings is the usual method. The plants furnish plenty of flowerless shoots in early autumn. These should be taken off when 3" or 4" long, trimmed up neatly, for bruised cuts mean damping off, dibbled thickly into sandy soil covered with a layer of sand, and struck in bottom heat over a gentle hotbed or a warm propagating frame. Sometimes Heliotropes keep badly during the winter, and thus it is necessary to work up more stock in spring. The autumn cuttings should then be placed on a shelf in a warm house, where they soon begin to grow. The cuttings may be taken off in batches, and dibbled in, as they can be obtained. Propagation by means of seed may also be practised.

Soil.—A light, rich soil is needed for Heliotropes in the flower beds, and it will be found that a good dressing of leaf mould will greatly improve most loamy soils. Or a dressing of yard manure may be

given in autumn. It is a mistake to bring fresh, rank manure close to the roots of the plants.

Other Cultural Points.—The great difficulty in growing Heliotrope is to winter the plants properly. A light shelf near the glass in a house whose temperature does not fall below 50° is the best place, and where this can be given deaths will be few. In spring the rooted cuttings may be given one shift—into 3" pots, one plant in a pot—and this will last them until they are put out in the beds. The plants should not be planted erect, but lying rather on their sides, and in order to carpet the ground nicely the growths must be gone over at intervals and pegged down to the soil. Light wooden pegs from old besoms, or those furnished by the Brake Fern, answer admirably.

Heliotropes in the Greenhouse.—Specimen Heliotropes are very beautiful objects in the greenhouse. They may be trained against a wall, their growths being lightly tied in to cover the space, and, although they look a little stiff at first, this will soon pass off. All the pruning necessary will be to cut back straggling shoots, and those which are too vigorous, so as to keep the bottom of the wall furnished.

Standard Heliotropes are less frequently seen. To obtain them, cuttings should be taken early in the autumn, and grown in heat all the winter without being pinched. When they have reached the required height the tops may be taken out, and side branches will then begin to push. These may be trained out to a supporting trellis until the direction of the main branches has been established, when the trellis will not be needed. Either the pyramidal or the spherical-headed form may be adopted. The pruning will consist in cutting back the young growths each year to the hard wood, and the best time to do this is spring. A little more heat and syringing for a few weeks after pruning will help the formation of young growth. At other times Heliotrope does not need the syringe, the foliage is too woolly.

Principal Species :—

corymbosum, 4', My., peruvianum, grh., bl.,
Sep., grh. shr., lil. fragrant.

Other Species :—

convolvulaceum, 2', sum., luteum, 6', Je., Oct., grh.,
hdy. ann., wh. fragrant, grn., yel. (*syn.* Tournefortia fruticosa of Botanical Register 464).
curassavicum, 9', Je., Jy.,
st. sub-shr., wh., yel. voltaireanum, vio., dwarf
eye. hybrid.
indicum, 1', Je., Aug., st.
ann., bl.

A Selection of Varieties :—

Of the many vars. that are in cultivation a selection of the best is given. All are fragrant.

Madame Jubbinger, Miss Nightingale, Rose Clair, vio., bl., lvs. dark pur., grn.

Buffon, M. Vilgrain, White Lady, pale bl., lvs. grn.

Adèle, Bouquet Parfumé, Madame P. Athlès, dark vio., bl., lvs. grn.

HELIPTERUM.

Charming half-hardy annuals, perennial herbs, or shrubs (*ord.* Compositæ), with pretty "everlasting" flowers, suitable for winter bouquets, and well adapted for pots as well as for the border in summer. Manglesii is a favourite pot plant. Propagation, by seeds sown where they are to bloom early in April, or in pots in a warm house in

March, and pricked off into pots, four or five plants together. Soil, rich and light, in a sunny position.

Principal Species:—

humboldtianum, 1½', Jy., ann., yel. (*syn.* *Sandfordii*).

Manglesii, 1½', pk. or pur., yel.; a beautiful little

ann. (*syn.* *Rhodanthe Manglesii*); flore pleno and album are fine doubles.

roseum, 2', Je., pk. (*syn.* *Acroclinium roseum*).

Other Species:—

canescens, 2', Je., pur. (*syns.* *Astelma canescens*, *Helichrysum canescens*, etc.).

corymbiflorum, 1', Jy., wh.

Cotula, 1½', My., wh. or yellowish wh. (*syn.* *citrina*).

gnaphaloides, 1½', Je., red, yel. (*syn.* *Gnaphalium modestum*).

humile (*see* *Helichrysum humile*).

incanum, 9'', Jy., yel., pk. or wh.

philomoides, 1', Jy., pur. (*syn.* *Astelma milleflorum*).

speciosissimum, 8', My., wh. (*syn.* *Astelma speciosissimum*).

variegatum, 3', Sep., wh. (*syns.* *Astelma spirale* and *A. variegatum*).

HELLEBORUS. (HELLEBORE.)

Description.—The *Helleboruses* embrace a number of our most valued border flowers, the Christmas and Lenten Roses being included among the number, with many others of great beauty in



HELLEBORUS NIGER ANGUSTIFOLIUS (*see p. 410*).

the border. Some are practically evergreen plants, and are very ornamental in or out of flower, with their beautifully shaped leaves. The flowers of many are of much beauty when cut, and their

Helixyra (*see Moraa*).

Helleborine (*see Epipartis*).

charms are longer displayed if the stems are partially split up when the blooms are inserted in water. Thus treated they will last several weeks in beauty. *H. niger* is the Christmas Rose, whose pure white flowers are so much admired in winter,



HELLEBORUS ORIENTALIS (*see p. 410*).

and the Lenten Roses are principally forms of *H. orientalis*.

Propagation.—By division of the plants, a good time being about the end of March if the weather is favourable, or in early autumn in showery weather. They may also be raised from seeds, sown as soon as ripe in a shady border, or in pans or boxes in a shaded frame. If the seeds are kept until spring they germinate more slowly. When the young plants are old enough to prick off this may be done, and the young plants grown on in a shady border of rich soil until of flowering size. They take some years to reach this size, but the results generally justify the long period of waiting.

Soil.—They like a rich soil, rather inclining to heaviness. On a poor, dry one they are frequently a failure.

Other Cultural Points.—They should always have plenty of water, especially when making their growth after flowering, and supplies of weak liquid manure may occasionally be given, with a mulch of good manure immediately after the flowering is over. The Christmas and Lenten Roses often have their flowers injured in appearance by splashes in winter, and they are much improved by being covered when in flower by a hand-light or sash raised on bricks or other supports so as to give air and keep off rain and mud splashes.

Cultivation in Pots and Frames or Pits.—With careful attention, the Hellebores may be grown in pots of rich soil, and subjected to gentle forcing, if afterwards put outside in a shady position, and well supplied with water during the summer. If grown in frames, the lights should be taken off in all favourable weather. In a few gardens the Christmas Roses are largely grown in pits where there is a slight heat, and where many blooms are produced by the exercise of care in watering and giving air.

Principal Species and Varieties :—

The names of the leading seedling forms are given below.

niger, Christmas Rose, 6" to 18", win., wh. One of the most useful of win. flowers. (For names of other vars., see Christmas Rose.)	olympicus, 2', Feb., Meh., pur. A pretty species.
— angustifolius, narrow lvs. (see p. 409).	orientalis, Lenten Rose, 1' to 2', Feb., ro. (see p. 409). Many exquisite vars., from wh. to deep pur., some with spotted blooms.

Other Species and Varieties :—

abschasicus, 1', Jan., grn. or pur.	— sub-punctatus, wh.
Antiquorum, 1½', Jan., pk.	latifolius, 1½', Meh., wh. (syn. intermedius).
— roseus, 1½', Jan., pk.	lividus, 1½', Meh., grn.
caucasicus, 1½', Feb., grn.	— lividescens, pur.
— albus, wh.	— roseus, bluish.
— lutescens, yel.	odorus, 1½', Meh., grn. (syn. atrorubens, cu- preus, etc.).
colchicus, 1½', Jan., pur.	— purpurascens, grn., pur.
cyclophyllus, 1½', Meh., grn.	viridis, 1½', Meh., grn.
fœtidus, 1½', Meh., grn.	— Dumetorum, grn.
guttatus, 1½', Feb., wh., spotted pur.	— multifidus, grn.

There are many pretty Hellebores, such as torquatus and punctatus, not traceable to the above.

Selection of Named Hellebores :—

Albin Otto, wh., spotted crim.	F. C. Heinemann, pur., crim. spots.
Apotheker Bogren, pur. spotted.	Frau Irene Heinemann, pur. spotted.
Beethoven, ro.	Gertrude Jekyll, wh.
Bismarck, deep pur.	Irene, pk.
Brutus, coppery ro.	James Atkins, ro. pk.
Chancellor, ro.	Prof. Schleicher, wh.
Councillor Benary, wh., pur. spots.	Sylvia, ro.
Dr. Hogg, ro.	Willie Barr, ro.
Ellen Terry, olive.	Willie Schmidt, ro.

HELMHOLTZIA.

Two species only of greenhouse perennial herbs (ord. Philylraceæ), with sword-shaped leaves, something like those of a Gladiolus. The flowers are borne on tall stems in big, plummy panicles, and are rather pretty. Increase is by division of the root usually; occasionally by seeds. Soil, sandy loam and peat in equal parts. They make unsatisfactory pot plants, and are only seen at their best when planted out in a prepared border as in the Temperate House at Kew.

Principal Species :—

glaberrima, 3' to 4', My., grh., wh. (syn. Philyltrum glaberrimum of Botanical Magazine 6056).

HELMINTHOSTACHYS. (INDIAN FLOWERING FERN.)

A pretty but curious looking stove Fern (ord.

Helmet Flower (see *Aconitum*, *Coryanthes*, and *Scutellaria*).

Helmia (see *Dioscorea*).

Filices), closely related to Botrychium. Propagation is very slow and difficult, as young plants are rarely, if ever, raised from spores, and the only method of increase is by division of the crowns. Soil, loam and leaf mould in equal parts, with sand. Plenty of water is needed during the growing season, but as the plant is deciduous, it needs little during the winter, only enough, in fact, to prevent its succulent rhizome from shrivelling.

Only Species :—

zeylanica, fronds 1' to 1½' long, barren below, spore-bearing above (syn. dulcis).

HELONIAS.

A genus of four species only (ord. Liliaceæ). Bullata, 1' to 1½', summer, hardy, purple rose, small, is a pretty herbaceous perennial from North America. Propagation, by division of the roots,



HEMEROCALLIS FLAVA (see p. 411).

which is, however, a rather slow process, and by seed. The divisions should be made in spring. Soil, fibrous loam and peat. A moist, shady place is the most suitable. Latifolia is a broad-leaved variety of the species, not a synonym, as is sometimes stated.

HELWINGIA.

Curious Asiatic trees (ord. Araliaceæ), of little horticultural merit.

HEMEROCALLIS. (DAY LILY.)

Bright and effective herbaceous border plants (ord. Liliaceæ), hardy almost everywhere, and of much value, despite the short duration of the individual blooms. Propagation, by seeds sown in spring under glass, but preferably by division just when beginning growth in spring. Any good garden soil will do. The Day Lilies flower best in a sunny situation, and bloom freely

even in a dry place if well supplied with water when growing. The fine *H. aurantiaca* major is often a shy bloomer, and seems to like a strong soil in a sunny place.

Principal Species and Varieties :—

aurantiaca, 3', Jy., or.
— major, 3', sum., or.;
the largest, but shy.
Dumortieri, 1', Je., or.,
br. (*syns.* *rutilans* and
Sieboldii).
flava, 2', Je., yel. (*see*
p. 410).
fulva, 4', Jy., copper yel.

Several vars. : *angustifolia* : *disticha* fl. pl.,
semi-double, or., crim.,
foliage variegated, with
fine silver variegated
lvs. : (*syn.* *fulva* fl. pl.) :
and *maculata*, are all
worth growing.

Other Species :—

citrina, 2', Je., pale yel.
Middendorffii, 1', Je., or.,
yel.

minor, 8'', sum., yel., grn.
(*syn.* *graminea*).
Thunbergii, 2', Jy., yel.,
fragrant.

Hybrids :—

Apricot, apricot.
Flamid, or. yel.
flavo-Middendorffii, 'cit-
ron, br.

Orange, or.
Sovereign, or. yel.

HEMIANDRA.

Three species of greenhouse shrubs or sub-shrubs (*ord.* Labiate), natives of Australia, of little use to British gardeners.

HEMICHÆNA.

A genus of only one species (*ord.* Scrophularineæ), a hardy shrub with showy flowers, not often seen in cultivation. Propagation, by cuttings of the ripened shoots under a bell-glass in heat, towards the end of the summer. Soil, loam and peat in equal parts with one-sixth of sharp sand.

Only Species :—

fruticosa, 3' to 6', Jy., yel.

HEMIONITIS. (IVY-LEAVED FERN.)

Handsome and distinct stove Ferns (*ord.* Filices) of compact habit, and suitable for growing in Wardian cases. Propagation, by spores, which are borne by the older plants in great numbers, and by the plantlets which some of the species bear in the lobes of the fronds. The latter should be pegged down on well-drained pans of moist soil to give the little plants a chance. Soil, two parts of fibrous peat, one part of sand, and one part of live sphagnum moss, chopped. In Wardian cases the plants will often grow in sphagnum alone. *Hemionitises* produce very few roots, and these quickly perish if the soil be at all sour or waterlogged. Small pots only should be given them, and these must be well drained—quite one-third full of crocks.

Principal Species :—

cordata, barren fronds 2'' to 4'' across, 6'' high, fertile fronds, 1' long, 1½'' across, dark, shining grn., heart-shaped bulbils.

palmata (Ivy-leaved Fern), barren fronds 2'' to 6'' across, 6'' to 8'' long, fertile fronds 6'' to 12'', pale grn.

HEMIPHRAGMA.

There is only one species in this genus (*ord.* Scrophularineæ), although it is rather variable. *Heterophyllum*, summer, pink, fruits black, is a

Hemiclidia (*see* *Dryandra*).

Hemidictyum (*see* *Asplenium*).

Hemimeis (*see* *Alonsoa*).

Hemistemma (*see* *Hibbertia*).

prostrate herb that is very nearly hardy ; in severe winters a little dry litter should be thrown over it. Propagation, by seeds and cuttings, preferably in spring. Any well-drained garden soil will suit, provided it is neither very hungry nor very heavy.

HEMITELIA.

A fairly large genus of tropical Tree Ferns (*ord.* Filices), related to the *Cyatheas* on the one hand, and the *Alsophilas* on the other, and coming half way between. When properly grown most of the *Hemitelias* attain to noble proportions, trunks 15' in height being not uncommon, hence they are adapted for the most part only to very large and lofty houses. *Capensis* is an exception, for it may not only be grown in a cool house, but is dwarfer in habit than the rest, and also very slow in vertical growth. A curious growth, like delicate filigree work, at the base of the fronds and covering the crown, is a special attraction in this species. Propagation, by spores, of which great quantities are produced annually. They should be sown when ripe. Likewise by offsets, which occasionally make their appearance, sucker-like, from the base of the trunk near the root, and also laterally from adventitious buds along the stem. Soil, peat and loam in equal parts, with plenty of sand.

Principal Species :—

capensis, 6' to 12', fronds 3' to 5', grh., deep grn. (*syns.* *Amphicosmia capensis* of Moore, and *Alsophila capensis* of J. Smith).

horrida, fronds 7' to 10', st., dark grn., frond stems and trunk thorny (*syn.* *Cyathea horrida*).

Smithii, 10' to 15', fronds 5' to 7', grh., frond stems covered with chestnut - hued scales (*syn.* *Cyathea Smithii*).
Walkerae, fronds 5' to 7', st. or warm grh. (*syn.* *Amphicosmia Walkerae* of Moore).

Other Species :—

bella, fronds 5' to 7' (*syn.* *Amphicosmia bella*).
grandifolia, trunk 4' to 5', fronds 5' to 7', st.

setosa, fronds 5' to 7', st. (*syns.* *Alsophila setosa* and *Cyathea beyrichiana*).

HEMLOCK (*see* CONIUM).

HEMLOCK SPRUCE (*see* TSUGA CANADENSIS).

HEMP.

A name given to several coarse and strong vegetable fibres, chiefly to the produce of *Cannabis sativa*, the Indian Hemp; also to the plant itself. The fibre is obtained by macerating the stems and leaf petioles in water, and afterwards by combing, cleaning, and carding. The Hemp Agrimony is *Eupatorium cannabinum*.

HEN AND CHICKENS.

One of the popular names of *Saxifraga umbrosa*, also known as "London Pride" and "Mother of Thousands." It bears reference to the quantity of young plants which are thrown out all round by the parent plant in supposed likeness to a hen and her chickens. The name is also bestowed, for similar reasons, upon a profliferous variety of double Daisy wherein a number of secondary "flowers," each with a separate stalk, spring from the primary "flower." Proliferation of this kind is, however, not confined to the Daisy, but may be commonly

Hemp Agrimony (*see* *Eupatorium cannabinum*).

Hembane (*see* *Hypocygnus*).

Henfrey (*see* *Alyssum*).

Henna Plant (*see* *Larsonia alba*).

observed in the Zonal Pelargonium, the wild Ribwort Plantain, the Tuberous Begonia, and occasionally in the Rose.

HEPATICA (*see* ANEMONE).

greenish white flowers. They will grow nearly anywhere, but are far too coarse for the herbaceous garden, and should only be tolerated in the wild garden, where they are at home by the borders of streams or lakes. They will also thrive in shrub-



Photo: Miss Mary Heat, Andover.

A BEAUTIFUL HERBACEOUS BORDER (*see* p. 413).

HEPTAPLEURUM.

A large genus, but horticulturally an unimportant one (*ord.* Araliaceæ), of tall shrubs and trees. Paratropia and Sciadophyllum are synonyms.

HERACLEUM.

Tall, coarse-growing, annual or perennial herbs (*ord.* Umbelliferae), with huge umbels of white or

berries, where less robust subjects would die. Propagation, by seed for the annuals, and by seeds and root division for the perennials. Any soil. Upwards of seventy species have been described, most of them valueless.

Principal Species:—

flavescens, yel., per.

villosum, 10' to 12' (*syn.* giganteum).

Other Species :—

giganteum (*var.* *villosum*).
gummiferum.
lanatum, 4' to 8', per., wh.
 (*syn.* *barbatum*).
nepalense.

Panaces.
persicum, 12', bien., wh.
pubescens, 12', bien., wh.
sprengelianum.
Wallichii.

HERBACEOUS BORDERS.

Well managed and properly cultivated herbaceous borders are among the most attractive features of a garden, as they can be made to supply an almost regular succession of flowers during the respective seasons of spring, summer, and autumn, and, in a lesser degree, in winter as well. The name "herbaceous border," which properly signifies one devoted entirely to plants of herbaceous habit, is, however, inappropriate to the finest borders of the present day, as in these are cultivated not only perennial herbaceous plants and bulbs (also herbaceous) but in addition annuals and shrubs. A good border is incomplete and unsatisfying unless it contains a fair number of these subjects, which help to furnish it at a dull season with greenery, or, as in the case of the annuals, are most valuable when early bulbs and plants have passed out of bloom. A herbaceous border requires careful study if it is to be of a successful kind, and not only are proper preparation and planting required at first, but continual attention so as to maintain its freshness and brightness.

Preparation.—To be thoroughly effective, a herbaceous border ought to be of considerable length and breadth. This cannot always be secured, but in large gardens one of 12' wide is not too much if it can be made of proportionate length. A good loam is the best for a mixed border, but with due manuring and care herbaceous plants may be grown in any soil. The position should not be too shaded, and it ought to be free from the drip of trees. If long cultivated, and the subsoil has been properly prepared, the border may be deeply trenched. If unsuitable for this, it is better only to bastard trench the border, and a description of this process will be found under the proper heading. The manure applied must be well decayed. For general purposes farmyard manure is the best, but artificials may be used in the proportions recommended under **ARTIFICIAL MANURES**, according to the nature of the soil.

Time of Planting.—If the ground is vacant, which is seldom the case, planting might begin in August, which is the best season for many things, such as the Flag Irises. This would allow the plants to become established before winter sets in. Failing this time the flowers may be put in from September to November, according to the nature of the season and the climate. In cold, wet districts, spring is a better time for planting than late autumn, but in localities where drying winds prevail at the former period, and where the soil is light, autumn is the best season.

Arrangement.—It is impossible to treat of the arrangement of a herbaceous border in detail, and it must be left mainly to individual taste and experience to deal with it, and to correct any errors in planting which are certain to arise, even with experienced planters of such flowers. As a main principle, however, it may be said that an absolutely uniform method of planting with all the taller flowers at the back, and the others arranged according to their heights until the dwarfest occupy the front of the border, is too stiff for such plants, and it is desirable to depart to

some extent from this plan by having taller flowers here and there near the foreground. Care must also be taken that the time of flowering is studied, so that there is not only a due balance of bloom all over the border at each season, but that the colours of the flowers in each part will harmonise and not jar upon the eyes with crude and unpleasant effects. This matter of colour arrangement is exceedingly important, and it is almost an axiom that it is better to have quiet harmonies of different shades of the same colour than glaring contrasts. A desirable thing to observe in planting early spring flowers, which are generally very dwarf, is to see that they are not all at the front of the border.

After Management.—If kept well manured and fertile by top dressings of farmyard or artificial manures, a border will last a long time without replanting. When this is necessary, plants which have grown too large may be reduced and replanted, care being taken to use some of the fresh growths at the outside of the old stool instead of the worn-out centres. Watering ought to be well attended to. The beauty of the border will be longer maintained if the old flowers are picked off, and such plants as will give a second bloom if cut down in good time, attended to in this respect. Staking and tying must also be done early, and the stakes ought to be as unobtrusive as possible. It cannot be too strongly put that the gratification given by a herbaceous border depends upon the amount of care bestowed upon it. Easy as are the greater number of the plants to grow, few will repay better any attention which may be given them.

HERBACEOUS PLANTS.

The question of what constitutes a herbaceous plant often gives trouble to exhibitors and judges. Popularly speaking, herbaceous plants only comprise those which have stems that die down yearly, but have perennial rootstocks which retain life during the "resting period." As the "Rules for Judging" of the Royal Horticultural Society well point out, a class for "Hardy Herbaceous" would exclude annuals, biennials, and plants of more or less shrubby growth, and tufted evergreens whose stems do not die down in winter. It has been suggested, and the suggestion is being largely followed, that such a class should be simply for "Hardy Border Flowers," with the addition of words excluding such things as annuals, biennials, or shrubs, as may be required. "Hardy Flowers" is the term proposed by the Royal Horticultural Society, with the addition of such qualifying words as may be desired to meet the views of the framers of the schedules.

In ordinary gardening practice the term "herbaceous flowers" is exceedingly indefinite in its application, and nothing is commoner than to hear all hardy plants of perennial character which are not truly shrubby, called herbaceous plants. Sub-shrubs are frequently included, and, in many instances, plants of biennial duration are ranked with true herbaceous plants. This broader view is the more useful for the garden, although if a strictly botanical view of the meaning of the term "herbaceous" were adopted annuals, as well as biennials and perennials, would have to be included. Without attempting to minimise the beauty and usefulness of the many other lovely things of different habit among the annuals and true shrubs, it cannot be denied that the herbaceous plants of perennial growth possess many advantages.

especially over the annuals. They live from year to year, and their annual reappearance is looked for with eager expectancy. The hardier plants in particular are, in the case of the more robust species, apart from the Alpines, of very easy cultivation, and can be grown in almost any good soil. Their uses, too, are manifold, and their characters varied in the extreme. They lend themselves to formal gardening, to the requirements of the wild garden, or to decorate the slopes and stones of the rock garden. Some do well in pots in the greenhouse and conservatory, and others come in to grace the window of a room. Their numbers are too great to particularise, and any list of reasonable length of the best genera included under the designation of "herbaceous plants" would be far from complete. For species, and how they are to be cultivated, the reader is referred to their respective genera.

HERBERTIA.

Half-hardy bulbous plants (*ord.* Iridæ) of considerable beauty, but not at all common in gardens. The genus is allied to Tigridia. Propagation, by seeds and offsets. The latter should be carefully removed after growth has been finished, and potted singly in small pots in rather light soil. A cold frame kept close is the best place for old and young plants alike. If they are grown in the greenhouse, it should be on a shelf near the glass. Sandy loam and peat, or leaf soil, in equal parts, with sand, make a good compost.

Principal Species :—

drummondiana, 6", bl., sepals tipped wh. (*syn.* *cœrulea*).

Other Species :—

pulchella, 9", Jy., pur., bl. (*see* figure).

HERBS (POT).

A collection of pot herbs is one of the most useful things that a garden can contain. Of the various subjects which are used by the cook for flavouring and garnishing certain dishes, some are always in request, and it is necessary that a supply should be kept up. Others which are not so frequently asked for should be grown, but in smaller quantity. Here is a list of the most important of pot herbs.

Balm.	Lavender.	Rosemary.
Borage.	Marjoram(Sweet).	Sage.
Chervil.	Mint.	Tarragon.
Fennel.	Parsley.	Thyme.
Horehound.		

Others which are not so important, but which are sometimes asked for, are :—

Angelica.	Chives.	Rue.
Basil (Bush and Sweet).	Coriander.	Savory (Winter and Summer).
Burnet.	Dill.	Southernwood.
Caraway.	Hysop.	Tansy.
Chamomile.	Pennyroyal.	Wormwood.
	Purslane.	

With the exception of Parsley, which it is convenient to sow as an edging round the vegetable quarters, and Chervil, which, when once established in almost any odd corner, reproduces itself year after year from self-sown seed, it is advisable to locate all the herbs in a border by themselves. The best aspect for the "herb border" is west. South is too hot, and north and east are so cold that the produce is too late in making its appearance, that is, with the exception of Thyme and Sage, which will do very well on a north or an

east aspect. The ground should be well dug and manured prior to planting, and each year, in the autumn, a heavy mulching of short, half-rotted manure should be given both to protect and nourish the roots. Plant in rows about 1' apart; this leaves plenty of room to get about among the plants to gather the produce.

Basil, Marjoram, and Mint should be cut down just before they come into flower and dried for winter use. Tarragon should also be cut down, but in a dried state it is not much in request.

HERITIERA (of Aiton, *syn.* BALANOP-TERIS).

A small genus of stove evergreen trees (*ord.* Sterculiaceæ), with unisexual flowers, and leaves with a silvery white under surface. To the last named characteristic the popular name of Look-



HERBERTIA PULCHELLA.

ing Glass Tree is due. Cuttings of the ripened shoots will root fairly quickly in bottom heat towards the close of the summer. Soil, sandy loam, with about a fifth part of leaf mould.

Principal Species :—

<i>littoralis</i> , red.	<i>macrophylla</i> , red. Look- ing Glass Tree.
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HERMANNIA.

Greenhouse evergreen shrubs (*ord.* Sterculiaceæ) of distinct appearance. There are many species, but few of them are cultivated, and those only in botanic gardens.

HERMINIERA (*syn.* EDEMONE).

A genus of one species only (*ord.* Leguminosæ). *Elaphroxylon*, the "Ambash" or "Pith Tree," so

Herb of Grave (*see* *Ruta*).

Herb Paris (*see* *Paris quadrifolia*).

Herb Robert (*see* *Geranium robertianum*).

Hercules Club (*see* *Xanthoxylum*).

frequently alluded to by travellers in tropical Africa, is a tall stove shrub with yellow flowers. It is a very thirsty subject in cultivation, and it is well to have the pot containing it standing 3" or 4" deep in water. Propagation, by seeds. Soil, loam two-thirds, leaf mould one-third, and sand.

HERMINIUM. (MUSK ORCHIS.)

Pretty and interesting terrestrial Orchids (*ord.* Orchidaceæ), one of which, *Monorchis*, is found on dry, chalky banks in Britain. Propagation, by division of the roots before growth starts in spring. The divisions do better if potted singly in small pots and consigned to a cold frame for the first year. They must not be coddled, for they are quite hardy. Soil, chalky loam and leaf mould in equal parts, with sand.

Principal Species :—

Monorchis, 3" to 6", Jy., hdy., grn., yel.; British.

HERNANDIA. (JACK-IN-A-BOX.)

Handsome stove evergreen trees (*ord.* Laurineæ), widely dispersed naturally, but rarely cultivated.

HERNIARIA. (RUPTURE WORT.)

A small genus of hardy, low-growing herbs (*ord.* Illecebraceæ), chiefly represented in gardens by the useful *glabra*, which is so much in request for carpet bedding. It is this that is employed to form the close, dense, green "carpet" which acts as the groundwork for taller-growing subjects. Being perfectly hardy, it may remain out of doors all the winter, and, unless it is desired to change the plan of the carpet bed, the tenderer subjects may be lifted in the autumn, and a few bulbs or Wallflowers introduced to fill the vacancies. The ground should in all cases be firm, for not only do the plants make a better growth upon such ground, but the solidity is of the greatest importance where the beds are built up in terraces. Propagation, by divisions and cuttings in autumn. Small pieces will grow if dibbled into a firmly made up bed of soil. When the plants are not allowed to remain in the beds all the winter, they should be planted out as early in the spring as practicable, in order that they may have a good long season of growth.

Principal Species :—

glabra, 1", stems prostrate, sum., grn., small.

HERON'S BILL, or CRANE'S BILL.

A popular name for some of the British species of *Erodium* and *Geranium*. The name bears reference to the long "beak" of the fruit, which is supposed to resemble the long beak of the heron.

HERRANIA.

A small genus of greenhouse evergreen trees (*ord.* Sterculiaceæ), rarely cultivated, and of little decorative value.

HERRERIA.

A genus of three or four species of greenhouse subjects (*ord.* Liliaceæ), with small, fragrant flowers, climbing stems, and tuberous rootstocks. They are easily grown and make pretty plants for the conservatory, although *Sarsaparilla* is probably the only species cultivated. Propagation, by seeds or cuttings in spring, in heat. They like a compost of peat, loam, and sand in equal parts.

Principal Species :—

Sarsaparilla, 8', Je., Jy., grh., grn., yel. (*syn.* *parviflora* of *Botanical Magazine* 1042).

HESPERANTHA. (EVENING FLOWER.)

There are about twenty species of these dwarf bulbous plants (*ord.* Irideæ), all natives of tropical Africa and the Cape, but all thriving in a greenhouse temperature. They answer to the same cultural treatment as *Ixias*, to which, indeed, they are very closely related. The popular name, Evening Flower, is due to the fact that the flowers expand in the evening.

Principal Species :—

<i>angusta</i> , spr., wh.	<i>pilosa nuda</i> of <i>Botanical Magazine</i> 1475).
<i>cinnamomea</i> , 6", Ap.,	<i>longituba</i> , 6" to 9", red,
My., wh.; Cinnamon	br., wh.
scented.	<i>pilosa</i> , 6", Ap., My., wh.,
<i>falcata</i> , 6" to 12", Ap., br.,	spotted red.
wh. (<i>syn.</i> <i>Ixia falcata</i>	<i>radiata</i> , 6", Ap., Je., wh.,
of <i>Botanical Magazine</i>	striped red, br. (<i>syn.</i>
566).	<i>Ixia radiata</i> of <i>Botanical Magazine</i> 575).
<i>graminifolia</i> , 6", Aug.,	
Sep., grn., wh. (<i>syn.</i>	

HESPERIS. (ROCKET.)

Although there are upwards of twenty species in this genus (*ord.* Cruciferae) only two or three of them find a place in ordinary gardens. Two species stand out from the rest, viz. *matronalis*, the Damask Violet and *Dame's Rocket*, as it is popularly called, and the fragrant *Night-Scented Stock*, *tristis*. The latter species is a biennial. Seed may be sown in a shaded border in July, the plants being subsequently transferred to nursery beds to stand the winter, and planted out in their flowering quarters in spring. The Common Rocket, *matronalis*, is a good, old-fashioned, cottage garden perennial. It thrives nearly anywhere, and in almost any sort of soil. There are numerous varieties with flowers of different hues, and doubles are not uncommon. Propagation is by seed and division of the roots in spring for the singles, and by root division for the doubles. *Tristis* does best in dry, shallow soil, and is one of the subjects that may be reckoned upon for wall gardening.

All the species named below are quite hardy.

Principal Species :—

<i>matronalis</i> , 2' to 3', sum.,	bien., yel., wh., or dark
per., flowers various,	pur.; does well on old
fragrant in the evening;	walls. Night-scented
flore pleno is a pretty	Stock.
double var. Common	<i>violacea</i> , 6" to 12", Je.,
Rocket.	ann. or bien., vio.
<i>tristis</i> , 1' to 2', sum.,	

Other Species :—

<i>arabidiflora</i> (now <i>Parrya</i>	<i>grandiflora</i> , 2' to 3', Jy.,
<i>limnium</i>).	bien., wh., pur.

HESSEA (*syn.* PERIPHANES).

Greenhouse bulbs (*ord.* Amaryllidæ). Propagation, by seeds, or offsets from the old bulbs. Soil, sandy loam, with a little leaf mould. Plenty of water is needed when growth is being made, none in the resting season.

Principal Species :—

<i>crispa</i> , 3', Ap., Aug., grh.,	<i>gemma</i> , 1', Aug., grh.,
pk. (<i>syn.</i> <i>Strumaria</i>	pale yel. (<i>syn.</i> <i>Strumaria</i>
<i>crispa</i> of <i>Botanical Magazine</i> 1363).	<i>gemma</i> of <i>Botanical Magazine</i> 1620).

Hesiada (*see Sideritis*).

Hesperocordum (*see Brodiaea*).

Other Species :—

filifolia, 6", Nov., grh., wh. (*syns.* *Imhofia filifolia* and *Strumaria filifolia* of *Botanical Register* 440). *stellaris*, 6", Oct., Nov., grh., pk. (*syns.* *Amaryllis stellaris* and *Strumaria stellaris*).

HETERANTHERA.

Ornamental, aquatic, perennial herbs (*ord.* Pontederacæ). Rarely grown.

HETEROPAPPUS.

Erect-growing, hardy herbs (*ord.* Compositæ), closely allied to the Asters. Propagation, by division of the roots in spring, and by cuttings during spring and summer. The latter root quickly if dibbled into a bed of sandy soil in a cold frame, where they can be kept close and shaded for two or three weeks. Any ordinary garden soil suits.

Principal Species :—

hispidus, 1', Sep., wh. — *decipiens*, aut., ray florets pur., disc yel. (*syn.* *Aster hispidus*).

HETEROPTERIS.

Tropical shrubs (*ord.* Malpighiaceæ), sometimes of climbing tendencies, needing a stove temperature. The flowers are small and for the most part inconspicuous. Propagation, by cuttings of tips of the ripened shoots, which root freely in sandy soil in a propagating frame in which there is plenty of bottom heat. Soil, loam, leaf mould, and peat in equal parts, with sand.

Principal Species :—

chrysophylla, Mch., cl., grn. above, golden br. or., red., lvs. dark below. *purpurea*, cl., pur.

HETEROSPATHE.

A genus of one species only (*ord.* Palmæ) of handsome stove Palms. Increase is by imported seeds. Soil, fibrous loam two-thirds and leaf mould one-third, with sand.

Only Species :—

elata, grn. (*syn.* *Metroxylon elatum* of gardens).

HETEROTHECA (*syns.* *CALYCIUM* and *DIPLOCOMA*).

A small genus of hardy or half-hardy herbs (*ord.* Compositæ). Inuloides is the only one generally met with. Propagation, by seeds or division of the roots. Any common garden soil will do, but it requires a little protection during the winter. It is well to assign it a sheltered position, and then a light covering of Bracken will be all that is needed.

Principal Species :—

inuloides, 1' to 1½', sum., hlf-hdy., yel. (*syn.* *Diplocoma villosa*).

HETEROTOMA (*syn.* *MYOPSIS*).

Annual or perennial herbs (*ord.* Campanulacæ), chiefly represented in gardens by *lobelioides*, which is a pretty half-hardy or greenhouse subject. Propagation, by dividing the roots in spring when the young growths are about 1" long. Each shoot that has a few roots attached will grow, if it is

potted in rather sandy soil, and started in a close frame. Soil, loam two parts, leaf mould one part, and sand.

Principal Species :—

lobelioides, Bird Plant, spr., grh., pur., yel.

HEUCHERA.

Description.—Hardy herbaceous plants (*ord.* Saxifragæ), of tufted, perennial habit. They are chiefly of interest because of the great beauty of sanguinea and its varieties, the flowers of which during the summer months are of great value for cutting. Although less showy, *micrantha*, a taller and stronger-growing species, is also valuable for supplying cut flowers. These plants are worthy of space in all gardens. In addition to giving them



HEUCHERA SANGUINEA (see p. 417).

a place in the herbaceous border, it is a capital plan to grow some plants in the reserve garden, solely for cutting from.

Propagation.—By division of the crowns during spring. The old clumps should be lifted and carefully divided with a stout knife, the divisions being replanted at once in nursery beds of rather sandy soil in a warm and sheltered position, and grown there for a year. When planted straight away into their permanent quarters there is frequently a heavy percentage of deaths.

Soil.—Heucheras like a warm soil of medium texture, but they will grow in almost anything save pure sand and heavy clay, that is, where they have plenty of light and air. Unfortunately, they do not make good town plants, and although they may exist amongst the smoke for a year or two, they get weaker each season, and finally succumb.

Heterotrichum (of Bieberstein, see *Saussurea*).
Heterotropa (see *Asarum*).

Heterocentron (see *Heeria*).

Heterochata (see *Aster* and *Erigeron*).

Heteroloma (see *Desmodium*).

Heteromcles arbutifolia (see *Photinia*).

Heteronoma (see *Arthrostenma*).

Principal Species, Hybrid, and Varieties :—

americana, 1½', sum., red, plant hairy.
micrantha, 2', sum., yel., wh., good for cutting.
— rosea, ro.
rosea, hybrid (sanguinea × pilosissima).
sanguinea, 9' to 18', sum., deep red (see p. 416). The

best species; several vars., with larger and more richly coloured flowers, including grandiflora and splendens.

— alba, wh.
zabeliana, 1', sum., pk. hybrid.

Other Species :—

caulescens (see villosa).
cylindrica, 1' to 1½', sum., grn.
glabra, 1', sum., wh.
hispida, 2' to 4', My., Jy., pur. (syn. Richardsonii).
Menziesii (see Tolmiea Menziesii).
pilosissima, 1' My., grn.

pubescens, 1', sum., pale red (syns. pulverulenta and ribifolia).

pulverulenta (see pubescens).

ribifolia (see pubescens).

Richardsonii (see hispida).

villosa, 1' to 3', Aug., Sep., vio. (syn. caulescens).

HEVEA (syns. MICRANDRA and SIPHONIA).

Tall tropical trees with milky juice, from the American forests (ord. Euphorbiaceae). Only one or two species have been introduced into this country, and these do not appeal to gardeners. The genus is valuable, however, as a rubber producer, the famous Para rubber being obtained from brasiliensis. Propagation, by cuttings of the half-ripened shoots in sand, in brisk bottom heat. Soil, sandy loam.

Principal Species :—

brasiliensis, 60', My., st., grn., wh. Para Rubber Tree.

HEXAGLOTTIS.

Greenhouse bulbous plants (ord. Iridae). Propagation, by offsets and seeds. Pot or plant in sandy loam and leaf soil. General treatment as for Ixias and other Cape bulbs will suffice.

Principal Species :—

longifolia, 18", My., yel. (syns. Homeria flexuosa, Ixia longifolia, and Morea flexuosa).

virgata, 2', My., yel. (syn. Moraea virgata).

HIBBERTIA.

Evergreen, shrubby, greenhouse plants (ord. Dilleniaceae), mostly climbers or trailers, suitable for baskets, pillars, or rafters in a conservatory; the yellow flowers are often finely contrasted with neat, dark purple green leafage. Nearly all the species are Australian. Propagation, by cuttings of firm growth in spring, placed in a close propagating frame. Soil, three parts of loam, one part of peat, and sand. Close tying spoils the beauty of the climbing species.

Principal Species :—

Cunninghamii, 3', Jy., (syn. Candollea Cunninghamii).
dentata, 10', spr., sum., aut., cl., dark lvs.
fasciculata, 3', sum. (syn. virgata).
grossulariifolia, 6', spr., (syns. crenata and Bertonia grossulariifolia).
Reidii, 9" to 12", spr., sum.
volubilis, 10', sum. (syn. Dillenia speciosa); unpleasantly scented.

(syns. crenata and Bertonia grossulariifolia).

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volubilis, 10', sum. (syn. Dillenia speciosa); unpleasantly scented.

(syns. crenata and Bertonia grossulariifolia).

linearis, 8', Je.
pedunculata, 3', Je. (syn. corifolia).

perfoliata, 3', My.
saligna, 3', Jy.
stricta, yel.
virgata (see fasciculata).

HIBISCUS.

Description.—Upwards of 150 species are included in Hibiscus (ord. Malvaceae), and these comprise plants of wonderfully varied habit and appearance. Some are herbs, others are shrubs, and a few attain to the proportions of trees. Many have showy flowers, and are valuable garden plants. The economic value of the genus is considerable. Several species, including cannabinus, yield fibre, Cuba Bast being furnished by the inner bark of elatus. The fruits of esculentus are used in the Tropics as food and for thickening soups, and the plant is largely cultivated on this account.

Propagation.—The methods of propagation vary with the character of the species. The shrubs may all be increased by cuttings, the stove species and varieties in heat, and the hardy syriacus and its numerous varieties with only the shelter of a cold frame. The annual Trionum may be raised in quantities from seeds, and the same may be said of Manihot, which, however, requires rather more heat, so as to ensure speedy germination of the seed, and a long season of growth.

Soil.—For the hardy annuals and perennial herbs any ordinary garden soil will suit, providing that it be well drained. The hardy shrubs need a rich, loamy soil, and for the pot plants two-thirds of loam and one-third of leaf mould, with sand, form a good compost. For the leaf mould old Mushroom bed manure may be substituted in the case of large plants.

Other Cultural Points.—The stove shrubs, like Cameronei and rosa-sinensis and its varieties, need a fairly hard pruning in early spring, as well to keep them within bounds as to improve the colour and size of the flowers, for the latter are borne upon the young wood near to the termination of growth. After the pruning, frequent syringings are desirable, and later on, when the plants are in full growth, liquid manure will help. Frequent potting is not necessary, a shift every three or four years being all that big specimens need. An annual top-dressing should, however, be given, the upper layers of old soil being removed and replaced by new. The top-dressing should be of rich loam with one-fourth of its bulk of well-rotted cow manure. Syriacus does not need a lot of pruning, but when the knife has to be used early spring is the best time. Manihot is worthy of special treatment. The seed should be sown early in the year, and the seedlings potted as soon as the roots have reached the sides of the pots. Fine specimens can then be had in 10" pots, that will bloom freely in the autumn.

Principal Species and Varieties :—

Cameronei, Je., Jy., st. shr., ro., lvs. much cut and very pretty.
coccineus, 4' to 8', Jy., Aug., grh., se. (syn. speciosus of Botanical Magazine 360).
elatus, 50', st., pur., gives Cuba Bast (syn. Paratium elatum).
esculentus. The Gombo or Oehroa.
— speciosus, yel.
Manihot, 8', sum., aut., or win., grh. per., yel., spotted blk.; may be used for sub-tropical bedding.
marmoratus, Feb., grh. shr., wh., spotted ro.
rosa-sinensis, 10' to 15', sum., aut., st., ro., crim.
— brilliantissimus, crim.
— Calleri, buff, yel., crim., se. base.
— Cooperi, se., lvs. grn., wh., crim.
— fulgidus, crim.

Hewardia (see *Adiantum*)

Hexacontis (see *Thunbergia*).

- *miniatus* semi-plenus, semi-double, sc.
- *vivicans*, semi-double, crim., sc.
- *zebrinus*, sc., edged yel.
- schizopetalus*, st., or., red.
- syriacus*, 6', Aug. to Oct., hdy. deciduous shr., various colours; many vars., of which albo-

plenus, anemonæfflorus, bicolor hybridus, carneo-plenus, cœleste, Leopoldii, Painted Lady, Pompon Rouge, totus albus, violaceus variegatus, and Violet Clair are some of the best.

venustus, st., shr., crim., yel.



HIDALGOA WERCKLEI.

Other Species and Varieties:—

- | | |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| <i>africanus</i> (see <i>Trionum</i>). | <i>radiatus</i> , sum., st. shr., yel., crim., prickly; flore purpureo is ro. pur., and Lindleyi pur. |
| <i>ferox</i> , 3', My., Jy., st. shr., yel., prickly. | <i>roseus</i> , 3', hdy. |
| <i>Huegelii</i> quinquevulnerus, Aug., grh., ro. | <i>speciosus</i> (see <i>coccineus</i>). |
| <i>militaris</i> , 2' to 4', sum., hdy. herbaceous per. (<i>syn. hastatus</i>). | <i>splendens</i> , 12' to 20', My., grh. shr., ro., prickly. |
| <i>Moscheutos</i> , 3', sum., hdy., wh. | <i>Trionum</i> , 2', sum., hdy. ann., yel., pur. centre (<i>syn. africanus</i> and <i>ternatus</i> of Cavanilles). |
| <i>Patersonii</i> (now <i>Lagunaria Patersonii</i>). | <i>Bladder Ketmia</i> . |
| <i>pedunculatus</i> , 2' to 4', sum., grh. shr., ro., red. | |

HICKORY.

A general title applied to the several species of the genus *Carya* (which see).

HIDALGOA.

A small genus (*ord. Compositæ*), only one species of which has been introduced, namely *Wercklei* (see figure). This is a pretty plant, climbing freely by means of its leafstalks (petioles), and blooming profusely. Though not fully hardy, it may be grown out of doors in summer. Like the *Dahlia*, it will not withstand frost. Propagation, by cuttings. Soil, good loam.

Only Species Introduced:—

Wercklei, 12' to 20', Jy. to Oct., per., ray florets sc., disc florets yel. (*syn. Childsia Wercklei*).

HIERACIUM.

An extensive genus (*ord. Compositæ*), consisting, with one exception, of hardy herbaceous perennials.

Higginsia (see *Hoffmannia*).

All the species are yellow. Quite a number are British, and known as Hawkweeds. Propagation, by division or seeds, in spring or autumn. Almost any kind of soil or position will suit. The greenhouse shrub *fruticosum* needs a sandy, peaty compost.

Principal Species:—

- | | |
|---------------------------------------------------|--------------------------------------------------------------------------|
| <i>aurantiacum</i> , 1½', Jy. | <i>lanatum</i> , 3, sum. |
| <i>canadense</i> , 2', Jy. | <i>saxatile</i> , 1', sum. |
| <i>fruticosum</i> (see <i>Tolpis fruticosa</i>). | <i>villosum</i> , 1', Jy. (<i>syn. valdepilosum</i>) perhaps the best. |
| <i>Gmelini</i> (now <i>Crepis Gmelini</i>). | |

Other Species:—

- | | |
|-------------------------------------------------|------------------------------|
| <i>alpestre</i> (now <i>Crepis alpestris</i>). | <i>Kalmii</i> , 1½', Aug. |
| <i>corymbosum</i> , 3', Jy. | <i>Pilosella</i> , 6'', sum. |
| | <i>undulatum</i> , 1½', Jy. |

HIEROCHLOË.

Fragrant hardy perennial Grasses (*ord. Gramineæ*), propagated by seed or division. Garden soil. Commonly called Holy Grass, from being formerly used in churches on saints' days.

Principal Species:—

- | | |
|--------------------------------|--------------------------------------------------------------------|
| <i>alpina</i> , 1', Jy., grn. | <i>redolens</i> , 2' to 3', sum., grn. (<i>syn. antarctica</i>). |
| <i>borealis</i> , 2', My., br. | |

HINDSIA.

Shrubby greenhouse evergreens (*ord. Rubiaceæ*). Propagation, by cuttings of young growth in bottom heat. Soil, loam, leaf mould, and sand.



Photo: Cassell & Company, Ltd.

A HIPPEASTRUM OF THE POPULAR AMARYLLIS SECTION (see p. 419).



HIPPEASTRUMS, POPULARLY KNOWN AS AMARYLLISES.

Principal Species :—

longiflora, 2', Aug., bl. — *alba*, 2', My., Je., wh.
(*syn.* *Rondeletia longiflora*). *violacea*, 3', My., vio., bl.,
the best.

HIPPEASTRUM (*see also* AMARYLLIS).

Description.—A large genus of strong-growing, bulbous plants (*ord.* Amaryllidac.), with showy flowers borne on stout, erect spikes. The leaves are usually long, strap-shaped, and deciduous, but there are a few exceptions. The various species are chiefly natives of South America and the West Indies, and several of them, notably *equestre*, *Leopoldii*, and *vittatum*, have, in the hands of the hybridiser, been the means of producing the beautiful race of garden plants known popularly as Amaryllises (*see* p. 37). *Reticulatum* and its hybrids grow best in a stove the whole season through;

regium and *Amaryllis Regina*).

reticulatum, 1½', spr., ro. sc., veined sc. (*syns.* *Amaryllis reticulata*, *Coburgia reticulata*, and *Leopoldia reticulata*).
rutilum, 1½', spr., crim., grn. (*syn.* *bulbosum*);

citrinum, *crocatum*, and *fulgidum* are handsome vars.

solantraeflorum, 2', Jan., Mch., wh., grn., ro.
vittatum, 2½', Apr., crim., red, wh. (*syn.* *Amaryllis vittata*).

Other Species and Hybrid :—

advenum, 1', win., or., red (*syns.* *Amaryllis advena*, *Habranthus hesperius*, *H. miniatus*, and *Eustephia macleanica*).
andreaeanum of *Kew Hand-List* (*see* *Amaryllis* *Belladonna* and *Belladonna Lily*).

bifidum, 1½', Mch., red (*syns.* *angustum* and *Habranthus bifidus*).
brachyandrum, 1½', sum., pk.
bulbosum (*see* *rutilum*).
calyptratum, 1½', sum., red, grn., yel. (*syn.* *Amaryllis calyptrata*).



HIPPEASTRUM AULICUM STRIATUM.

they are not deciduous. The handsome winter-flowering *aulicum* succeeds in an ordinary plant stove; if not potted annually, liquid manure should be freely given to assist growth and flowers. The lilac-coloured *procerum* has very long-necked bulbs; it needs a peaty soil and an intermediate temperature, but should not be absolutely dried off during winter.

Principal Species, Hybrids, and Varieties :—

Ackermannii, 1½', spr., — *splendens*, improved form.
deep crim., hybrid; a very bright form is *pulcherrima*.
andreaeanum, 1' to 1½', pale red, striped dark red (*syn.* *Amaryllis andreaeanum* of gardens).
aulicum, 2', win., spr., crim., or., grn. (*syn.* *Amaryllis aulica*).
— *striatum*, striped and netted (*see* figure).
equestre, 1½', sum., red, grn. base (*syn.* *Amaryllis equestris*).

angustum (*see* *bifidum*).
Bagnoldii, 1', sum., grn., yel., red (*syn.* *Habranthus Bagnoldii*).
bicolor, 1½', aut., red, yel., grn. (*syns.* *Amaryllis bicolor*, *A. cyrtanthoides*, *A. ignea*, and *Phycella biflora*).

pratense, 1½', sum. (*syns.* *Habranthus pratensis* and *H. speciosus*).
Roezii, 1½', sum., or., red.
stylosum, 1½', My., car. red. (*syns.* *Amaryllis stylosa* and *A. maranensis*).
vittatum harrisonianum, 2½', red, wh.

HIPPOBROMUS.

A greenhouse shrub or tree (*ord.* Sapindacae), increased by cuttings, in sandy soil, under a hand-glass. Pot in sandy loam. The only species is *alatus*, 20', summer, red.

HIPPOCREPIS.

Annual or perennial Vetches (*ord.* Leguminosae), hardy, with the exception of *balearica*, which requires protection during winter. Propagation, by seeds or division, in spring. A light, sandy soil is best.

Hippocentaurea (*see* *Erythraea*).

Principal Species :—

comosa, 6", spr., per.,
yel., good rock trailer
(syn. helvetica).

helvetica (see comosa).
multisiliquosa, 1', sum.,
ann., yel.

Other Species :—

balearica, 2', spr., shr.,
yel.

glauca, 6", spr., per.,
trailer, yel.

HIPPOPHAÆ.

Hardy shrubs or small trees (*ord.* Elæagnaceæ), mostly natives of the sea coast, and hence thriving well within a short distance of the sea. They can, however, be well grown inland, provided a fairly moist situation is available. They never look better than when planted near water. In summer the neat,



THE FINE KEW SPECIMEN OF HIPPOPHAÆ RHAMNOIDES, THE SEA BUCKTHORN.

HIPPOMANE.

This stove tree (*ord.* Euphorbiaceæ) is the West Indian "Manchineel." Propagation, by cuttings placed under a bell-glass, in heat. Soil, loam, sand, and peat. The species Mancinella, 50', May, green, has very poisonous milky juice, which will blister the skin, and may cause blindness if allowed to touch the eyes. The yellow fruit, though tempting in appearance, is extremely acrid and poisonous.

silver-hued leafage is effective, but during autumn and winter, when crowded with brilliant orange berries, the plants are most beautiful. As male and female flowers are borne by separate plants, it is necessary, to ensure a full crop of berries, to include male bushes in plantation. Propagation, by layering, root cuttings, suckers, and seeds.

Principal Species and Varieties :—

rhamnoides, 6' to 12', My. — siberica, Ap.
— angustifolia, 2', My. — taurica.

Other Species :—

argentea (now *Shepherdia* *canadensis* (now *Shepherdia canadensis*).
argentea).
salicifolia, 8' to 20', spr.

HIPPURIS.

The commonest member of this genus (*ord.* Haloragaceæ) is *vulgaris*, 9", summer, green, red. This is the Mare's Tail, a perennial aquatic found wild in Great Britain and distributed through Europe and North America. It closely resembles the Equisetums in general habit, and makes an attractive plant for lake margins or stream sides.

HODGSONIA.

This genus (*ord.* Cucurbitaceæ) consists of but one species—*heteroclita*, May, yellow and white, a strong climber. The large blooms, yellow outside and white within, are followed by big, Melon-like fruits that are not edible. Propagation is by seeds. A moist stove suits it, and it requires a rich rooting medium.

HOES AND HOEING.

Seeing how great a bearing the continual cultivation of the surface soil has upon the success or otherwise of a crop, it is obvious that the hoe is one of the most necessary of garden tools.

Although there are so many patterns, each having something to recommend it, they all fall naturally into two classes, according to the way in which the power is applied, viz. (1) the "draw" hoe, and (2) the "push" or "Dutch" hoe.

The make of draw hoe most commonly in use is generally known as the "swan-necked." For heavy soils a double necked hoe is made, the additional strength thus obtained being of importance. The triangular hoe is a favourite pattern for drawing drills. The Spanish or Vernon hoe is a swan-necked hoe with only one point to the blade. Occasionally a combination tool of hoe and pickfork may be seen, the two tools being placed, as it were, back to back. The hoe-pickfork is useful in heavy soils, and the pickfork end is handy for unloading manure.

The push or Dutch hoe is a splendid tool for use upon all soils. As a weed destroyer it has few equals. The Sprouton hoe is an ingenious invention. It can be used both as a push and a draw hoe, and as a spud. It is quite a departure from the ordinary hoe in pattern.

Hoeing forms a large part of the summer routine of culture in all well-regulated gardens. Not only are weeds kept down thereby, but well-stirred ground is much moister in periods of drought than unstirred, owing to the greater ease with which capillarity can come into play. Then, again, there is the fertilising influence of the air to be considered, and this alone is no small consideration. All growing crops greatly benefit by the frequent employment of the hoe among them in dry weather.

HOFFMANNIA (*syns.* HIGGINSIA and OHIGGINSIA).

Tropical herbs or shrubs (*ord.* Rubiaceæ), with handsome foliage and white, yellow, or red flowers. Propagation, by cuttings, which root readily at any time of the year if given a sandy soil, a close frame, and plenty of bottom heat. Stems of old plants may be cut up in spring into pieces, each containing an eye, and a fair proportion of these will root. Soil, loam two parts, leaf mould one part, and sand. A free use of the knife is necessary

in the case of old plants, which, if not given their annual spring pruning, soon become straggling and ungainly. Mealy bug is the worst insect pest.

Principal Species :—

discolor, 6" to 9", st., red, lvs. lurid grn. above, red pur. beneath (*syn.* *Campylobotrys discolor* of *Botanical Magazine* 4530).
Ghiesbreghtii, 2' to 4', st., yel., spotted red, lvs. 12" to 15" long, dark grn. above, pur. red beneath (*syn.* *Higginsia Ghiesbreghtii* of *Botanical Magazine* 5383).
— variegata, lvs. creamy wh., yel., red, dwarf; the handsomest.
refulgens, 1' to 2', st., My., red, lvs. grn. above, red below (*syn.* *Higginsia refulgens* of *Botanical Magazine* 5346).

Other Species :—

pedunculata, 2' to 3', st., yel.
regalis, 1', st., lvs. dull grn. above, red below, shr. (*syn.* *Higginsia regalis* of *Botanical Magazine* 5280).

HOLBELLIA.

There is only one species in this genus (*ord.* Berberidæ). It is a greenhouse evergreen climbing shrub that is remarkably easy to grow in any light soil. Cuttings of the half-ripened shoots root quickly if taken in spring and inserted in a gentle heat.

Only Species :—

latifolia, 20', Mch., grh., pur. or greenish pur., fragrant, cl. (*syn.* *Stauntonia latifolia*). There is a var., *acuminata*, which has seven to nine narrow leaflets to the leaf.

HOLCUS. (SOFT GRASS.)

A small genus of annual and perennial Grasses (*ord.* Gramineæ), of which *mollis* is a well-known British wilding. They are rarely cultivated, and only *lanatus albo-variegatus* is ever seen in gardens. The annuals are increased by seeds sown in spring, the perennials by seeds and by division of the tufts, which is also best done in spring. Almost any garden soil will do, but if loamy so much the better.

HOLLY. (ILEX AQUIFOLIUM.)

Description.—A valuable and beautiful evergreen shrub or tree (*ord.* Ilicineæ), of much worth for shrubberies, pleasure grounds, and hedges. The beauty of a good bush of the Common Holly, *Ilex Aquifolium*, with its prickly, glossy leaves, is greatly added to when it bears its bright red berries, which are so much prized for decorations at the festive season. It makes a fine hedge. There are many synonyms of the varieties, but those named are according to the *Kew Hand-List*. For other species, see *Ilex*.

Propagation.—The Common Holly is propagated by seeds, the berries being gathered when ripe and buried in sand until the following year, when they should be sown in nursery beds or lines in March or autumn. These beds must be kept clean, and may be partially shaded from sun and frost by branches. When about two years old the seedlings may be transplanted into rows 1' apart. In about two years more they may be removed again, giving them a little more space. The variegated and other varieties are propagated by budding in

Hog Plum (see *Spondias*).

Hohenbergia (see *Echmea*).

Hoitzia (see *Larselia*).

August with a bud which has not pushed, or in May with one making growth; also by grafting in March. Cuttings of half-ripe shoots taken in July root freely.

Soil.—Holly likes a good, loamy soil which is not of a very dry character.

Other Cultural Points.—The best time to plant Hollies is mid-April or early in May, or from the second to the fourth week in August. In all cases showery weather should be chosen for the work. Pruning or cutting ought to be done about the end of February with a knife, and not with shears, which disfigure the plant by injuring, without removing, the leaves.

Principal Varieties :—

Green-leaved :—

balcanica, lvs. shining, flat, whole, or spiny.
camelliaefolia, grn.
Hodginsii, grn., broad lvs.
latipinna, a large-spined and distinctly shaped leaf (*syn. hastata*).

laurifolia, grn.
— *longifolia*.
myrtifolia, a narrow-leaved var.
platyphylla, a broad-leaved, spiny form.
whittingtonensis, rather lance shaped, spiny lvs.

Gold- or Silver-leaved :—

argentea marginata, dark grn., with narrow silvery edge (*see figure*).
argentea medio-picta margin grn., creamy blotch. Silver Milkmaid.
aurea angustifolia, narrow-leaved, margin golden centre, pale grn.
aurea medio-picta, margin grn., centre blotched

yel. (*see p. 423*). Gold Milkmaid.
aurea-regina, margin golden yel., centre grn., grey. Golden Queen.
ferox argentea, deep grn., with creamy spines. Silver Hedgehog.
watereriana, neat shr., margin yel., centre grn., mottled or streaked yel.

Other Varieties :—

altaclarensis, grn.
angustifolia, grn.
argentea pendula, weeping.
argentea regina. Silver Queen.
atrovirens, grn.
aurea marginata, gold margin.
— *marginata*, lvs. pointed.
aurea pendula. Gold Weeping.
ciliata, grn.
— *major*.
Cookii, grn., yel.
crassifolia, grn., dwarf.
donningtonensis, grn., spines few.
ferox, very spiny.
flavescens, Moonlight, yel.

Foxii, dwarf, grn.
fructo-luteo, yel. berries.
handsworthensis, wh., grey, grn.
Hendersoni, grn.
heterophylla, tall, grn.
integrifolia.
latifolia aureo-marginata, broad, grn., margin yel.
lawsoniana, grn., blotched yel.
maderensis, grn.
— *variegata*, grn., blotched yel.
nobilis, grn., spines large.
ovata, grn., oval lvs.
recurva, grn., dwarf (*syn. tortuosa*).
scotica, grn.
— *aurea*, broad yel. edge.

The Holly Leaf Fly is *Phytomyza Ilicis*, a little black fly with a yellow proboscis and longish, transparent wings, which makes its appearance in early summer. It is the larva of this fly which cause the pale blotches sometimes met with on the upper side of the leaves of the Holly. They are small, whitish, and with a black mouth. The pupæ are brown, and remain in the leaf during winter. If very numerous, the affected leaves may be taken off and burned.

HOLLYHOCK.

Description.—A true perennial, the Hollyhock (*Althæa rosea*, *ord. Malvacæ*) is also fairly hardy, and, in the southern counties at all events, it will pass through the winter outdoors, with no other shelter than that of the friendly hedge or wooden

fence against which it rears its colossal spike of showy flowers in late summer and autumn.

Propagation.—The grower has the choice of several methods. First of all there is raising from seed. A packet of seed from a fairly good strain will yield a heavy percentage of double flowers with a wonderful range of colour, so that it is scarcely worth the trouble to propagate special varieties from year to year. Where the disease is at all to be feared, moreover, seedling Hollyhocks stand the best chance. The seed should be sown as soon as it is ripe, in shallow, well-drained pans, filled with sandy soil. Or it may be sown outdoors in July, the seedlings potted singly into 3" pots, wintered in a cold frame, and planted out to flower



Photo: Cassell & Company, Ltd.

THE SILVER-EDGE HOLLY, *ILEX AQUIFOLIUM ARGENTEA MARGINATA*.

the following season. Cuttings of the young growth, taken from old stools in spring, root readily in sandy soil in bottom heat; while single eyes, taken from the side shoots in July, just when the growths are getting firm and the eyes plump, will make plants in time. The eyes should be removed with a leaf attached, and dibbled into a bed of sandy soil in a cold frame. Perhaps the best of the vegetative methods of propagation is that of grafting. Young shoots about 4" long, taken from the old stools in spring, may be grafted on to 2" pieces of the thick roots. A pin or a sharp thorn may be used to fasten stock and scion together, and then a few strands of raphia may be bound round, and the potential plants potted singly into 3" pots. The soil should cover the point of union. In a close, warm frame, almost every one of the grafts will grow, and will make flowering plants the same season.



THREE BEAUTIFUL HOLLYHOCKS.

1, VISCOUNT WOLSELEY ; 2, ARTHUR SULLIVAN ; 3, MORDAUNT.

Soil.—Hollyhocks like a deep, rich soil. Where possible, the stations they are intended to occupy should be heavily dressed with manure, and dug roughly in autumn. To bring rank, fresh manure into contact with the roots of young plants means gross growth, soft tissues, and a probable attack of disease.

Other Cultural Points.—When frost has put an end to flowering in autumn, the plants should be cut down, and before the advent of hard frost, the stools should be lifted, placed in shallow boxes, covered with a few inches of soil, and consigned to a cold frame. Towards the end of January they should be placed in gentle heat, such as a vinery that has been started with the New Year. They will then furnish plenty of shoots, and root cuttings for grafting purposes. One potting may be given, from 3" into 5" pots, and planting out may take place as soon as they have filled these larger pots with roots. A little protection on cold nights may be necessary. In good soil Hollyhocks reach a height of 6' to 10', and, as they offer a good deal of resistance to the wind, stout stakes should be provided. For exhibition purposes the plant should be restricted to one lead, and if many flower buds are produced they may be thinned. For ordinary purposes no restriction of growth or thinning of buds is necessary.

The Hollyhock Fungus has wrought much harm to the Hollyhock, and during the years 1873 and 1874, when it seemed to attain to the height of its virulence, it swept off whole collections of choice varieties. Prior to that date the Hollyhock had been one of the florists' pets, and many named varieties had been raised, but since then it has in a measure fallen into disrepute. The fungus (*Puccinia malvacearum*) causing the disease belongs to a section of fungi which are especially harmful to cultivated plants, and it boasts as near relatives the smut on Wheat and the Chrysanthemum rust. It first shows itself on the leaves as small, reddish brown spots, slightly raised above the rest of the surface, and, on the reverse side of the leaf, by a discoloration. In severe attacks the leaves shrivel, and the plants, if they do not die, are crippled. Little is known about the life cycle of this fungus, and only the *Puccinia* form of it has been recognised. It is believed to have been brought over from Chili with the imported plants which were the ancestors of the modern Hollyhock, but it was not until 1873 that European cultivators first discovered that it was dangerous. It spread, however, with almost unparalleled speed, but its vigour soon began to abate, and now it is not nearly so destructive as it used to be.

Briefly, the methods of treatment may be summed up as follows:

(1) The destruction by fire of all leaves that show the spot, and, if the plant is badly attacked, of the entire plant.

(2) Spraying, as a preventive, several times during the course of the spring and summer with Bordeaux Mixture (which *see*), or potassium sulphide, 1 oz. to 3 gallons of water, giving enough at each spraying to thoroughly wet every part of the plant.

(3) Occasional propagation by seed instead of exclusively by cuttings, eyes, or grafts. Seedlings are more vigorous and resist the disease better than plants raised by other means. The plants should not be grown for two consecutive years in the same ground.

A Selection of Twelve Varieties:—

Acme, peach.	Mrs. Edwards, salmon.
Alba Superba, pure wh.	Nelson, light pur.
Conquest, dark crim.	Perfection, wh., flushed salmon.
Earl of Breadalbane, light red.	Queen of Whites, wh.
Joshua Clark, car.	Queen of Yellows, yel.
Miss Ashley, ro.	W. Thomson, pur.

This list of varieties might be almost indefinitely extended.

Amongst the singles, the Fig-leaved Hollyhocks, of which there are both yellow and white varieties, should not be forgotten. These are the offspring of *Althæa ficifolia*, which *see*.

HOLMSKIOLDIA.

Bright-flowered, evergreen stove plants (*ord.* Verbenacæ). Half-ripened shoots can be rooted



Photo: Cassell & Company, Ltd.

THE GOLD MILKMAID HOLLY, *ILEX AQUIFOLIUM*
AUREA MEDIO-PICTA (*see p. 422*).

in sandy soil if placed in a close, moist propagating case. Soil, fibrous peat, loam, and sand.

Principal Species:—

sanguinea, 4', sum., sc. (*syn.* *Hastingia coccinea*).

HOMALANTHUS.

Stove evergreen shrubs (*ord.* Euphorbiacæ), with unisexual flowers. They answer to the same cultural treatment as the stove Euphorbias, but are very seldom seen in cultivation.

Principal Species:—

<i>leschemautilianus</i> , 6', Aug., flowers wh. (<i>syns.</i> <i>populifolius</i> and <i>Omalanthus</i>)	<i>populifolius</i> of <i>Botanical Magazine</i> 2780.
	<i>polyandrus</i> , lvs. grn. above, pur. beneath.

Holly, *Sea* (*see Eryngium*).

Holm Oak (*see Quercus*).

Hologymne (*see Lasthenia*).

Other Species :—

fastuosus, flowers grn. *bium giganteum* and
giganteus (*syns.* *Carum-* *Dibrachion peltatum*).

HOMALOMENA (*syn.* *HOMALONEMA*).

Dwarf evergreen stove plants (*ord.* *Aroideæ*), from the East Indies. Propagation, by seeds, cuttings of the stem, or divisions. Soil, peat, leaf mould, sand, and charcoal. Moist and shady conditions are essential to success.

Principal Species :—

insignis, 4' to 7', spathe grn., spadix wh. *rubescens*, 1½', sum., pur., red, wh. (*syn.* *rubra*).
picturata, 3' to 6', sum., grn., wh. (*syn.* *Curmeria picturata*). *Wallisii*, sum., red, wh., variegated foliage (*syn.* *Curmeria Wallisii*).

Other Species :—

peltata, 3', sum., pk., wh., cream. *Roetzlii*, 6'', sum., br., crim. (*syn.* *Curmeria Roetzlii*).

HOMERIA.

Cape plants (*ord.* *Iridæ*) with bulbous or tuberous roots, and producing showy flowers. Though hardy in some situations, they are best managed as cool greenhouse plants. Propagation, by seeds and offsets. Soil, sandy peat. They require scarcely any water when resting.

Principal Species and Varieties :—

collina, 1', spr., red, yel. *— miniata*, 8'', spr., red
(*syn.* *Moræa collina*). (*syns.* *collina* and *Moræa miniata*).
— aurantiaca, 1', spr., or., red, yel. (*syns.* *aurantiaca*, *Moræa aurantiaca*, and *Bobartia aurantiaca*). *elegans*, 1', sum., yel., br., or. (*syns.* *spicata* and *Moræa spicata*).
— lineata, 1', spr., red, yel.

HOMOGEYNE.

This genus of Alpines (*ord.* *Compositæ*) is not horticulturally valuable. The solitary heads of white or purplish flowers are borne on stems not above 1½' high. A niche in the rock garden will suit them. The only species occasionally cultivated are *alpina*, *discolor*, and *sylvestris*.

HONESTY (*see* **LUNARIA**).**HONEY BEE.**

From a purely horticultural point of view the Honey Bee (*Apis mellifica*) is valuable, inasmuch as during its search for nectar and pollen it causes pollination among flowers. This, as a general rule, leads to increased fertility on the part of trees, shrubs, and plants visited by the little workers. Some varieties of Pears and Apples are well-nigh self sterile, hence those who have charge of orchards should obtain the assistance of bees and so secure cross-pollination and good crops.

HONEYDEW.

The exudation of sticky, sugary sap from the leaves and green parts of some plants is popularly known as honeydew. Such exudation usually takes place during a period of drought and heat, and is a proof that the plants affected are "out of sorts," that is, their respiratory and digestive organs are not in proper order. Lime trees, when in good

soil, frequently produce honeydew so extensively that the sticky moisture dropping on a pavement will make it quite slippery. The stickiness of leaf and branch caused by aphides must not be confounded with this extravasation of sap. The latter can sometimes be corrected by watering with a weak solution of common salt, as this gives greater fluidity to the sap and reduces the secretion of starchy matter.

HONEYSUCKLE. (*LONICERA*).

Beautiful and free-flowering, erect and shrubby climbers (*ord.* *Caprifoliaceæ*). The species are best provided with a position in the front of the shrubbery. The dwarfier ones may be accorded a place in the rock garden, whilst the climbers are seen to the best advantage on the walls of houses (*see p.* 425), on pergolas, balconies, and trellises. Though the fragrance of *Caprifolium* and *Periclymenum* is well known, the beauty of their red fruits is often overlooked. All should be given a rather moist loam with exposure to sun. (For species, varieties, and culture, *see* **LONICERA.)**

HOODIA.

These greenhouse succulents (*ord.* *Asclepiadæ*) have spiny, angled stems; they are dwarf and perennial. Propagation, by cuttings, placed on a greenhouse shelf, in the sun, to allow the wound to heal before they are inserted. Broken brick rubble, sand, and good loam, in equal quantities, form a suitable compost. Established specimens need abundance of water during summer, but little during winter. Never shade them.

Principal Species :—

Bainii, 1', Jy., Aug., yel., pur. *Gordonii*, 1½', Jy., Aug., buff, pur.

HORDEUM.

Several species of *Hordeum* (*ord.* *Gramineæ*) are of great economic value, as they produce Barley. All the species are handsome Grasses, but *jubatum* is about the only one cultivated in the garden as an ornamental plant. Propagation, by seeds sown in autumn or spring.

Principal Species :—

distichon. *murinum*.
jubatum, 2', hdy. ann. *vulgare*.
maritimum.

HOREHOUND.

Formerly Horehound was more used in medicine than at present for its tonic properties. It still, however, enters into domestic remedies. The drug is obtained from *Marrubium vulgare* (*ord.* *Labiatae*). It is probable that the hoary appearance of this species suggested the popular name, and that the common appellation is merely a corruption of Hoarhound. (*See also* **MARRUBIUM**.)

HORNBEAM.

The white, hard, and close-grained timber produced by members of the genus *Carpinus* doubtless suggested the popular name of Hornbeam. Both the Common Hornbeam (*Carpinus Betulus*) and the more showy Hop Hornbeam are elegant park

Homoianthus (*see* *Perezia*).

Honey Berry (*see* *Melicocca bijuga*).

Honey Flower (*see* *Melianthus*).

Honey Locust (*see* *Gleditschia*).

Honeysuckle, African (*see* *Halleria lucida*).

Honeysuckle, French (*see* *Hedysarum multijugum*).

Honeywort (*see* *Cerinth*).

Hookera (*see* *Brodiaea*).

Hoop Petticoat (*see* *Narcissus*).

Hop (*see* *Humulus*).

Hoplophytum (*see* *Echmea*).

Horhelia (*see* *Potentilla*).

Hornminum (*see* *Salvia*).

trees. It is, however, as a shelter tree and hedge plant that the Common Hornbeam is most useful, for, like the Beech, it does not lose its foliage for a long time after its leaves are dead and other

Propagation.—By pieces of the roots, about 8" long and of the thickness of the little finger.

Soil.—Fertile loam not containing fresh manure; if of a sandy nature so much the better.



Photo: C. Church, Dublin.

HONEYSUCKLE ON THE SIDE OF A HOUSE (see p. 424).

deciduous trees are perfectly bare. It can be severely pruned and clipped without harm resulting. (See also CARPINUS and OSTRYA.)

HORSERADISH.

The fleshy roots of the hardy plant *Cochlearia Armoracia*.

Other Cultural Points.—The best system is to make trenches 10" wide and 4" deep, into which some good manure is packed firmly. Above this should be built a ridge of sandy loam 9" high,

Horned Poppy (see *Glaucium*).

Horn of Plenty (see *Fedia Cornucopia*).

narrowing to 4" wide at the top. "Whips," or small roots, should then be selected, cutting one end squarely and the other slantingly, and forcing these into each side of the ridge at an angle of about 30° at intervals of 10". The base of the fully grown root should not quite reach the manure. This will ensure splendid results, and it is the work of only a few minutes to get at the crops. Fresh ridges should be formed each year, the length being governed by individual requirements.

HORSFIELDIA.

A small genus (*ord.* Araliaceæ) that is botanically interesting, because it in some degree connects the Umbellifers with the Araliads. Its members are evergreen stove shrubs, requiring similar treatment to Aralias. The species are aculeata and peltata; both are prickly.

HOSACKIA.

Dwarf annual or perennial herbaceous plants (*ord.* Leguminosæ). Propagation, by seeds or division. They are very attractive in ordinary soil in the rock garden.

Principal Species:—

bicolor, 1½', sum., per., wh.	crassifolia, 3', sum., per., grm., br. grandiflora.
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HOTBEDS.

These are prepared by collecting stable litter or other fermenting material into heaps either indoors or out, using the heat as an aid to the cultivation of plants. When managed successfully, hotbeds are among the most useful of the many aids to successful cultivation; the heat produced by them is moist and genial, and many plants take more kindly to it than to fire heat. In some instances brick pits are constructed to hold the manure; in other cases the manure is built up into a heap 4' high, and a frame placed on the top. Stable litter usually forms the principal part of hotbeds, though leaves, half-spent tan, and grass are all made use of. When the material is being prepared it should be turned and well shaken about, and any dry parts damped every alternate day for a week. It should then be built in a tidy heap, using leaves and tan with the manure. The leaves and tan do not make such a fierce heat as the manure, but hold longer. When the heap is built to the required height a frame should be placed on, leaving a margin of manure 2' wide all round. About three days after the hotbed has been made the heat will be at its height, and until after that time plants should not be put in. After the third day, soil may be put into the frame if the plants are to be planted, and Coconut fibre refuse if the bed is to be used for standing pots on or for plunging them in. When the heat begins to decline, manure banked up round the outside will be found to put fresh life into the heap, or short manure may be forked into the bed. If a brisk heat is wanted for a short time only, grass will

be found useful; it becomes very hot, but does not retain the heat for any great length of time. In the building of the bed it is important that it be made evenly and trodden firm, otherwise it will become very uneven by sinking in at the loose places.

HOTEIA (*see* ASTILBE).

HOTTONIA.

Hardy herbaceous water plants (*ord.* Primulacæ), with perennial rootstocks. Propagation, by division in spring. They may be grown in any pond where the water is not more than 1½' or 2' deep. When planting, a heap of good loam should be placed in the water, and the plants placed in the centre, or put in baskets.

Principal Species:—

inflata, 8'', Je., wh.	palustris, 1' to 2', Je., lil., yel. eye.
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HOULLETIA.

A small genus of epiphytal Orchids (*ord.* Orchidacæ), closely allied to Stanhopea, and requiring to be grown in the warmest house. Propagation, by careful division just as growth commences. They are best grown in baskets in a mixture of fibrous peat, charcoal, and sphagnum. When growing, plenty of heat and moisture should be given, reducing the water supply and giving a lower temperature when growth is completed.

Principal Species:—

brocklehurstiana, 2', sum., intermediate house, br., lip yel., dark spots, fragrant.	odoratissima, 2', sum., intermediate, red, striped light br., fragrant.
chrysantha, 2', sum., yel., chocolate blotches, lip spotted crim.	— antioquiensis, segments larger and broader.
lowiana, 1', sum., yel., wh.	picta, 2', sum., cinuabar br., tessellated with lighter br.

HOUSTONIA.

Pretty, dwarf-growing, herbaceous plants (*ord.* Rubiaceæ), suitable for the rock garden, and front of a herbaceous border; or they may be grown in shallow pans in a cold frame, and used for conservatory decoration. Propagation, by seeds as soon as ripe, or by division in autumn or spring. Soil, a fairly light loam. Plenty of water is required during summer.

Principal Species:—

cœrulea, 3" to 4", sum., bl.	purpurea, 6'', sum., pur.
— alba, wh.	serpyllifolia, 3" to 4", sum., wh.

HOUTTEA.

A small genus of tropical shrubs (*ord.* Gesneracæ). A hot, moist house is essential for their well-being. Propagation, by cuttings.

Principal Species:—

Gardneri, 2', Jy., Aug., red.	pardina, 2', Aug. to Oct., wh.
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HOUTTUYNIA.

Perennial herbaceous plants (*ord.* Piperacæ), requiring cool greenhouse treatment. Propagation, by division or seeds. Any light, rich soil suits.

Horse Chestnut (*see* *Asculus*).

Horse Dung (*see* *Manures*).

Horse Mushroom (*see* *Mushrooms*).

Horseradish Tree (*see* *Moringia pterygosperma*).

Horseshoe Vetch (*see* *Hippocrepis*).

Horsetail (*see* *Equisetum*).

Hortensia (*see* *Hydrangea*).

Hosta (*of* *Jacquin*, *see* *Cornutia*)

Hottentot Bread (*see* *Testudinaria Elephantipes*).

Hottentot Cherry (*see* *Cassine*).

Hottentot Fly (*see* *Mesembryanthemum*).

Hound's Tongue (*see* *Cynoglossum*).

Houseleek (*see* *Sempervivum*).

Principal Species :—

californica, 1½', sum., grn., wh. bracts. *cordata*, 1½', sum., hdy., grn., bracts wh., red.

HOVEA.

Description.—An Australian genus of rare but highly ornamental shrubs (*ord.* Leguminosæ). The leaves are usually small, oval or lanceolate in shape, and alternately arranged. The flowers are small, usually rich blue or purple in colour, and abundantly produced.

Propagation.—By cuttings of half-ripe shoots inserted in very sandy peat under a propagating case, or by seeds.

Soil.—Fibrous peat with plenty of sand.

Other Cultural Points.—Good drainage must be given, as they are very impatient of stagnant

footstalks of the flowers swell and become succulent and pulpy, the pulp being very sweet and edible. It is a native of China and the Himalayas, and in favoured localities may be grown out of doors; in other situations a cold greenhouse is its proper place. It may be increased by cuttings, and prefers a loamy soil.

HOWEA.

A small genus of Palms (*ord.* Palmæ), of which two species, both from Lord Howe's Island, are in cultivation. They are very handsome plants, making tall stems, with large heads of graceful leaves, often 9' or more long. Propagation, by imported seeds. Soil, good loam. Although both species will grow in a cool house with a minimum winter temperature of from 40° to 45°, they do



HOYA CARNOSA, THE WAX FLOWER (see p. 426).

moisture. Over potting must be avoided, as growth is slow. Stopping must not be neglected when young, or the plants will soon become leggy. Watering, at all times, but especially in winter, must be done very carefully, no water being given unless it is absolutely necessary, yet never letting the plants suffer from want of it. As little fire heat, and as much fresh air, as possible should be given, and the pots should be stood on a cool ash bottom. Although usually credited with being difficult to manage, Hoveas can be successfully grown if these items are attended to.

Principal Species :—

Celsi, 3', Mch. to My, pur. (*syns.* lanceolata, deep bl. (*syn.* elliptica). *pannosa*, and *villosa*). *longifolia*, 6', Mch. to My., *trisperma*, 3', Mch. to My., bl.

HOVENIA.

Half-hardy evergreen shrubs (*ord.* Rhamnæ). One species only, *i.e.* *dulcis*, 10', is in cultivation; it has handsome leaves, and short axillary and terminal racemes of small, greenish white flowers, which are borne in July. After flowering, the

much better if given 5° or 10° more heat. For house decoration they are exceedingly popular, and are better known under their synonym of *Kentia*. When grown in small pots for table decoration, liquid manure should be given frequently, and the leaves sponged occasionally to remove dust. Although both species grow upwards of 30' in height, they are usually seen in gardens varying from 2' to 15'. Scale is the most troublesome insect pest, and should be removed by sponging.

Only Cultivated Species :—

belmoreana (*syn.* *Kentia belmoreana*). *forsteriana* (*syn.* *Kentia forsteriana*).

HOYA.

Description.—Ornamental, evergreen, climbing shrubs (*ord.* Asclepiadæ), usually characterised by thick, fleshy, opposite leaves, and umbels of pretty flowers, wax-like in texture. Of the fifty or more species known, a fair number are in cultivation, all being ornamental plants, requiring stove

Howardia (*sec Pogonopus*).

or intermediate house treatment. As several species emit roots from the stem, after the manner of Ivy, they are well adapted for covering damp walls, or for growing on dead Tree Fern stems. Some species may be grown on wires running along the roof, and others again are quite at home trained to wood or wire trellises. The pretty bella should have baskets.

Propagation.—By cuttings 4" long, taken off in spring or summer, and inserted in pots of sandy soil plunged in a warm propagating case. Grafting weak-growing species on to strong ones is sometimes done, but own-root plants are the best.

Soil.—Fibrous peat three parts, fibrous loam one part, some small pieces of charcoal and sandstone, together with a good proportion of rough sand. The compost should not be broken up very fine.

Other Cultural Points.—Thorough drainage is essential to success, so that surplus water may be able to run quickly away, stagnant water being very harmful. When growth is active shoots should be kept tied in position, not allowing them to become entangled. Pruning consists chiefly of thinning the shoots when they become crowded, but the old flowering stems should not be cut away. The most troublesome insect pest is mealy bug; this may be kept under by sponging. The most useful species is, perhaps, *carnosa*, and this can be grown fairly well in an ordinary greenhouse. It is popularly known as the Honey Plant or Wax Flower. It should be kept dry in winter.

Principal Species:—

<i>australis</i> , 4', Oct., wh., tinged pk.	— <i>variegata</i> .
<i>bella</i> , 2' to 3', sum., wh., crim. centre (<i>syn.</i> Paxtoni).	<i>cumingiana</i> , 3', sum., grn., yel., pur. centre.
<i>carnosa</i> , 12', sum., pk., wh. (<i>see p.</i> 427).	<i>Griffithii</i> , 10', Jy., ro. red.
	<i>imperialis</i> , 8', sum., red, br., largest of all.
	<i>lacunosa</i> , 4', spr., yel.

Other Species:—

<i>cinnamomifolia</i> , 10', Jy., yel., grn.	<i>linearis</i> , 4', sum., wh.
<i>globulosa</i> , 8', sum., car.	<i>multiflora</i> , 8', sum., wh., yel.
	<i>Paxtoni</i> (<i>see bella</i>).

HUDSONIA.

Hardy evergreen shrubs (*ord.* Cistineæ), characterised by minute, Heath-like leaves and yellow flowers. Propagation, by cuttings. Soil, sandy peat, or peat and loam.

Principal Species:—

<i>ericoides</i> , 1', sum.	<i>tomentosa</i> , 1', sum.
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HUMBLE BEE.

A popular name used for *Bombus terrestris* and other species. Bees are very useful to the gardener, as they are instrumental, when searching for honey, in pollinating many flowers which would otherwise have little chance of producing fertile seeds. The Red Clover is dependent almost entirely on the bee for fertilisation. In a few instances the bee shirks the work of pollinating by boring a hole at the base of the flower, and obtaining the nectar from the outside.

HUMEA.

Description.—There are four species of herbs and sub-shrubs in this genus (*ord.* Compositæ), all

Huckleberry (*see Gaylussacia*).
Huegelia (*see Gilia*).
Humata (*see Davallia*).
Humble Plant (*see Mimosa pudica*).

natives of Australia, but the only one that is in general cultivation is the popular *elegans*, so much in request for greenhouse and conservatory decoration, and for sub-tropical gardening. The plant is a biennial, and sowing annually must be adopted, as a constant supply of young plants is necessary.

Propagation.—By seeds, sown about the middle of July, in well-drained pans of light, sandy soil, covered slightly, a sheet of glass placed over each pan, and the latter consigned to a cold frame and kept moist and shaded. Under these conditions germination is fairly rapid, and the young plants are strong and healthy.

Soil.—Loam two parts, old Mushroom bed manure rubbed through a $\frac{1}{2}$ " sieve one part, sharp sand one-sixth, and a little charcoal.

Other Cultural Points.—Humeas are rather difficult subjects to grow, although their beauty fully compensates for any extra trouble they may give. Many people lose their plants in the winter through keeping them too moist at the root, and syringing them. They should only be syringed when approaching the adult stage, and in warm weather, otherwise they turn yellow and die. From the seedling stage into a 3" pot, and from the latter into a 4½", the second shift to be given not later than the middle of September, is the best routine to follow. During the winter keep the plants in a warm pit, near the glass, and give them but little water. In spring, when they begin to start away freely again, they may be potted into 9" or 10" pots, and grown in a warm house until the end of May. Then, if they are destined for outdoors, they may be hardened off, and planted out about the middle of June. For pot culture 9" or 10" pots will be quite large enough. Staking is especially necessary for the outdoor plants, as they offer a good deal of resistance to the wind. Vaporising or fumigating must be practised to keep down green fly, which is very troublesome on indoor plants.

Principal Species and Variety:—

<i>elegans</i> , 5' to 7', Jy., Oct., grn., br., red, pk.,	crim. There is a form which grows 15' high.
	— <i>alba</i> , wh.

HUMULUS.

Economically, the genus *Humulus* (*ord.* Urticaceæ) is a very important one, for to it belong the brewers' Hops. Botanically, the genus is a small one, there being but two species, both herbaceous perennials. Propagation, by division of the roots in spring, occasionally by seeds. Hops need a deep, rich soil, as they are gross feeders, and this applies equally to *japonicus* and its golden variety as to *Lupulus*. For covering wire or wooden arches and trellises *japonicus* is a capital subject, and does almost as well in town as in country gardens. *Lupulus*, too, is very ornamental, especially when in fruit, and is worth growing as a decorative subject alone. The best method of training is to allow the shoots to twine up strings fastened to supports above and to pegs driven firmly into the ground. The young stems, with their leaves blanching, make an excellent vegetable when cooked like *Asparagus*.

Principal Species and Varieties:—

<i>japonicus</i> , the Japanese Hop. A handsome twiner, suitable for covering arbours, hdy., foliage grn. (<i>syn.</i> <i>Lupulus</i> of Thunberg). May be treated as an annual and raised from seeds.	<i>aureus</i> , a golden foliaged var., but liable to make
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gross growth and assume the normal grn. *Lupulus*, 6' to 10', sum., hdy., grn., yel.; male and female, the latter

in round spikes or heads. Of the cultivated vars. the White Bines, Bramblings, and Goldings are some of the best known.

HUNNEMANNIA.

One species only goes to make up this genus (*ord.* Papaveraceæ). It is a half-hardy herbaceous perennial, that likes a rich, well-pulverised soil. Propagation, by seeds sown in the open ground towards the end of the summer. The seedlings



HYDRANGÆA HORTENSIA ALBA (see p. 432).

need protection during the winter, and in the spring may be planted out in their flowering quarters.

Only Species:—

fumariæfolia, 2' to 3', Jy., Oct., hlf-hdy., yel., lvs. like those of *Eschscholtzia californica*.

HUTCHINSIA.

This genus (*ord.* Cruciferae) is nearly related to *Iberis* and *Iberidella*. The chief species is a handsome little rockery plant which may be increased by seeds in spring. The soil should be light and sandy, and the position bright and sunny, to get the best results.

Principal Species:—

alpina, 6'', spr., hdy., per., petraea, 3'', spr., hdy. wh., a pretty Alpine. ann., a native.

Hungarian Lotus (see *Nymphaea*).

Huntleya (see *Zygopetalum*).

HYACINTH.

The parents of the hundreds of handsome, large-flowered bulbs known as Hyacinths are *Hyacinthus orientalis* and the sub-species *H. o. provincialis* (*ord.* Liliaceæ), whilst the so-called Roman Hyacinths are the progeny of *H. o. albulus*, not of *romanus*, as the name would suggest.

Points of a Good Bulb.—A good bulb should be sound, hard, well ripened, and heavy in proportion to its size. There should be no softness near the crown or base when gentle pressure is applied with the thumb. It should also be deep, that is, its vertical should be greater than its horizontal diameter. A rough exterior does not matter in the slightest; indeed, experts have been known to express their preference for "rough" bulbs.

Propagation.—This is chiefly performed by the Dutch growers. New varieties are comparatively rare; they are generally raised from seeds.

Culture in Pots.—The bulbs should be obtained early in September, and potted up without delay. For the smaller bulbs 4'', for the larger 5'' pots will be found suitable, one bulb being placed in each pot.

Soil.—Loam two parts, dried cow manure rubbed through a sieve one part, and leaf mould one part, with sand.

Other Cultural Points.—Pot fairly firmly, and let the shoulders of the bulb just peep out of the soil. After potting, stand the plants on an ash bottom out of doors, cover each bulb with an empty, inverted pot, and bury the whole in ashes, preferably those from coal fires, or Cocoanut fibre. Great caution is needed in employing the ashes from gas fires, for contact with these has frequently been known to burn the tender growths. The bulbs should remain in the plunging beds for about six weeks, by the expiration of which time root action will be vigorous, and the young tops will be from $\frac{1}{2}$ '' to 1'' long. At this stage remove the plants to a cool, shady frame, gradually inure them to the light, and thereafter introduce them to heat as they are required. Forcing should never be hard. Usually a mean temperature of about 60° is ample; a rise to 70° means weakened foliage and thin, unsubstantial flowers. The more gradual the forcing, the finer the flowers will be.

Culture in Glasses.—Special glasses are made with shoulders upon which the bulbs may sit, their bases just touching the water. It has been stated that if the bulbs touch the water they will rot, but the experience of the writer is that it makes little or no difference. The glasses should be filled with soft water, a piece of charcoal the size of a large Hazel nut being placed in each. After six weeks in a dark cupboard, to help root formation, the plants may be brought to the light.

Roman Hyacinths.—These are specially adapted to early forcing, and the flowers are handy for cutting. Six bulbs may be placed in a 6'' pot, or a greater number in shallow boxes of fibre. The white variety is the commonest, but blue and pink varieties are also obtainable. They chiefly come from France.

Culture Out of Doors.—The usual practice in this country is to force the bulbs for one season only in pots or glasses, and then throw them away. If properly ripened off, however, Hyacinths will produce very fair flowers in the second and subsequent years. Although they are not suitable for forcing, they may well be planted out in the open borders, or even in the grass, and left to take care of themselves. Plant early in autumn. From 2''

to 3" of earth should lie above the crown of the bulb, and in localities where the spring is usually cold and late a still greater depth is advisable, as it tends to keep growth back until the weather is favourable. If frosts threaten when the young growths are appearing, a 1" mulching of Cocoanut fibre, or, failing that, of old, dry horse droppings, will ward off the danger.

Singles. A Selection :—

Rose and Light Pink :—

Cosmos.	Norma.	Triomphe des
Fabiola.	Rosy Morn.	Roses.

Crimson and Scarlet :—

Etna.	Lord Macaulay.	Von Schiller.
Garibaldi.	Robert Steiger.	

Light Blue :—

Blondin.	Grand Lilas.	Queen of the
Czar Peter.	Lord Derby.	Blues.

Dark Blue :—

Baron von Tuyll.	King of the Blacks.	The Sultan.
Grand Maitre.	King of the Blues.	

White :—

La Grandesse.	L'Innocence.	Mont Blanc.
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Blush :—

Grandeur à Merveille.	Voltaire.
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Yellow :—

Ida.	Obelisque.
King of the Yellows.	Queen of the Yellows.

Doubles. A Selection :—

Rose :—

Dainty Maid.	Duke of Wellington.
	Grootvoorst.

Crimson and Scarlet :—

Koh-i-noor.	Princess Louise.
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Blush :—

Anna Maria.	Lady of the Lake.
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Light Blue :—

Bloksberg.	Charles Dickens.
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Dark Blue :—

Laurens Koster.	Lord Palmerston.
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White :—

La Tour d'Auvergne.	Prince of Waterloo.
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Six for Glasses :—

Double varieties are not so suitable as single ones. The undermentioned are all singles :—

La Grandesse.	Grand Lilas.	Norma.
Fabiola.	King of the Blues.	Ida.

HYACINTHUS.

Botanically a rather small, but in other respects a highly important, genus of handsome flowering bulbs (*ord.* Liliaceæ), including the popular Hyacinths. The genus includes Bellevalia, Hyacinthella, and Peribœa. The species are rarely grown, but some of them are elegant, hardy plants, that like a light, rich soil and a sheltered, but not heavily shaded, position. Increase is by offsets from the bulbs, and by seeds.

Principal Species and Varieties :—

amethystinus, 4" to 12",	— albus, wh.
spr., hdy., bl.	Spanish
Hyacinth.	candicans (now Galtonia

Hyacinth, Grape (see Muscari).

Hyacinth, Musk (see Muscari).

Hyacinth, Starch (see Muscari).

Hyacinthella (see Hyacinthus).

Hyacinthine (see Toxiocandron).

ciliatus, 4", Jan., hdy., bl.; the earliest (*syn.* azureus and Muscari azureum).
corymbosus, 2" to 3", aut., grh., lil., ro. (*syn.* Massonia corymbosa).
orientalis, 8" to 12", spr., sub-hdy., flowers various, fragrant. Common Hyacinth.
 — *albulus*, 5" to 8", spr., wh., fragrant. Roman Hyacinth of gardens.
 — *provincialis*, a slender form of the type.

Other Species :—

romanus, 1' to 1½', My., hdy., wh. or pale bl., scentless (*syn.* Scilla romana of Botanical Magazine 939). Not the popular Roman Hyacinth.
spicatus, 3" to 6", Feb., hdy., pale bl.

HYBERNIA.

A genus of slender-bodied moths whose larvæ often work great havoc amongst the foliage of fruit and forest trees. These larvæ are all of the "looper" form. Perhaps the most destructive of the genus is the Mottled Umber Moth, *H. defoliaria*; *Leucophæaria*, the Spring Usher, preys upon the Oak, and *aurantiaria* (Scarce Umber Moth) and *rupicapraris* upon the Hawthorn. In all cases the pupæ hibernates in the ground underneath the trees from which they have dropped.

Remedies.—A dressing of quick lime or gas lime to the soil beneath the trees; sticky banding in autumn to prevent the ascent of the trunks of the trees by the wingless females; and spraying in spring, just as the leaves open, with Calvert's Carbolic Soft Soap—1 oz. to the gallon of soft water—applied lukewarm, are good. Paris Green, 1 oz. to 20 gallons of water, is even more effective, but the mixture must be kept continually agitated during the process of spraying. Although a poison, it is safe to use at this strength.

HYBRID.

A mule, or a cross between two species, not a cross between two varieties of the same species. (*See also* HYBRIDISING.) A bigeneric hybrid is a cross between species belonging to different genera. Thus, species of *Cattleya* and *Lælia* have been crossed with each other, and the result, a *Lælio-Cattleya*, is termed a "bigeneric hybrid." Some authorities hold, however, that if two species, belonging to different genera, will cross, it is evidence of an affinity so close that they ought to be placed in the same genus. The animal mule, or hybrid, is usually sterile, but this rule does not hold good in the plant world. Some hybrids are undoubtedly partially sterile, but others again seem to be possessed of an increased share of fertility.

HYBRIDISING.

The producing of a hybrid, or mule, by the crossing of two distinct species. Although the hybridiser and the cross fertiliser work hand in hand, and the term "hybridising" is frequently used to cover the work of both, the work of each is distinct, seeing that the cross fertiliser deals only with varieties and the hybridist with species.

Many of our races of garden flowers are of hybrid origin, the break away from the normal types having been first obtained by the fusion of two species, which resulted in a plant of more or less intermediate habit. This intermediate character is by no means a fixture. In very few cases indeed are the influences of the male and female parents so nicely balanced as to produce in the offspring a neutral habit. Usually the hybrid favours one of the parents more than the other, and no law can be laid down as to the prepotency

of either parent over the other. Sometimes the influence of the one parent is so slight as to be scarcely observable; at other times the progeny will favour one parent in, say, the form and colour of the flowers, and the other parent in the habit of growth.

Nor can any rule be expressed as to the probability or otherwise of two species fusing, unless it be the sufficiently vague one that it is governed by physiological affinity. Thus, species which are apparently widely separated from each other will cross quite readily, and others which are apparently quite closely related to each other will obstinately refuse to cross. The whole question of sexual affinity is involved, and at present much is more or less conjecture.

The hybridist, however, is working upon strictly scientific grounds. He does not hybridise for the sake of hybridising, or merely at random; and his

to something else which could not be produced without this now apparently useless connecting link.

HYDNUM.

A large genus—upwards of 200 species—of Fungi (*ord.* Hymenomycetes). They vary both in size and general appearance, but they may all be recognised by the prickly-like, spore-bearing branches which protrude from the under side of the cap or "pileus." They are common to almost all climates and latitudes, but the temperate regions contain the greatest number. The common British species, *repandum*, is not only edible but really delicious, although few people care to touch it. Some up-to-date cooks make a capital *purée* of these Mushrooms, and they are also used, like the common Agaric, to flavour stews. *Hydnum repandum* may easily be told from other common



Photo: Cassell & Company, Ltd.

HYDRANGEA ALTISSIMA (see p. 432).

confère the cross breeder is equally exact. Each has an ideal in view, and he selects the parents of the progeny with careful skill. Thus the microscope is not infrequently called into play to ascertain whether the grains of pollen from a particular plant are plump, clean, and well shaped before that plant is selected as the male parent, and if the pollen does not satisfy those conditions the plant is discarded. It is well within the possibilities of the future that the present system of plant classification may give place to another system under which they are grouped according to their inward affinities, and not so much their outward resemblances. It is safe to say that the hybridiser has done more than anyone else to throw light upon this question of affinities.

One curious instance of a bigeneric hybrid may be cited in *Philageria*, a cross between the climber *Lapageria rosea* and the shrubby *Philesia buxifolia*, its only congener. *Philageria* is to some extent intermediate in character between the parents, but, curiously enough, it is far less showy than either of its parents, and from a horticultural point of view is useless, except in so far as it may lead

Fungi by the curious way in which the "cap" is set on one side—turned up at the brim, as it were.

HYDRANGEA.

Description.—Greenhouse or hardy, deciduous or evergreen shrubs or trees (*ord.* Saxifragæ). Some of the species, notably *Hortensia* and its varieties, and *paniculata hortensis* (*syn.* *paniculata grandiflora*), are very largely grown both in pots and outdoors. *Hortensia* is hardy only in the southern portion of Britain, but there it will make huge bushes, and flower with the greatest freedom. *Paniculata hortensis* is perfectly hardy. The flowers of *Hydrangeas* are produced in large trusses (cymes, corymbs, or panicles), and are remarkable by reason of the number of sterile florets they produce. These florets constitute the showy part of the flower, and it is towards increasing their number and size that the aim of the cultivator is directed. The flowers of *Hydrangeas* will last for many weeks in condition, and ultimately they have to be cut off when they have become green with age.

Propagation.—By cuttings. A common practice, and one to be recommended, is to grow plants of

Hortensia with one head of flowers each. Such plants can be obtained in a little under a year from cuttings taken in spring. Short, stubby, flowerless shoots should be selected, dibbled singly into $2\frac{1}{2}$ " pots, and struck in a heated frame. Cuttings set with flower buds may also be taken in autumn.

Soil.—Good loam two parts, well-decayed cow manure one part, and sand.

Other Cultural Points.—The cuttings should be potted on as soon as they are rooted, and grown in a cold frame during the summer. Not later than the first week in August they should be given their flowering pots—5" or 6"—and when they have filled these with roots, every effort must be made to get them to ripen their wood and plump up their buds. To this end they should be stood out of doors on an ash bottom and fully exposed to the sun. Keep them dry and cool in winter, and start the first batch in heat about the middle of February, the others following in instalments at intervals of a few weeks. Blue Hydrangeas are much in request. These are often produced naturally by the presence of iron in the soil; where the plants are growing outdoors. The pink varieties can be turned to blue by dissolving 1 oz. of alum in 1 gallon of water, and watering the plants once or twice a week with it when they are in full growth.

necessary, both with *paniculata hortensis* and old plants of *Hortensia*, should be done towards the close of the flowering period, but the former should be cut harder than the other species.

Principal Species and Varieties :—

- altissima*, 8' to 30', hdy. (see p. 431).
- Hortensia* 2' to 3', grh. (*syns.* *opuloides* and *hortensis*, see figure); many vars. Common Hydrangea.
- *alba*, wh.; Japanese var. (see p. 429).
- *japonica*, 3', bl., wh. (vars. *cerulea*, bl.; *roseo-alba*, wh., ro.).
- *Lindleyi*, 4' to 7', sum., red, wh.
- *Mariesii*, 2' to 3', sum., grh., ro., pk., sterile florets, very large.
- *Otaksa*, pk.
- *Thos. Hogg*, wh.
- *variegata*, a poor flowerer, but pretty wh. and grn. foliage.
- paniculata*, 4' to 8', aut., hdy., wh.
- *hortensis*, 3' to 5', sum., aut., hdy., wh., should be pruned in Jan. or Feb., and have the young shoots reduced when 4" long (*syns.* *paniculata floribunda* and *p. grandiflora*).
- petiolaris*, Ap., My., hdy. against walls in south of England, wh., lvs. Ivy-like, cl. (*syns.* *scandens* and *Schizophragma hydrangeoides* of gardens. This is really a very different plant).
- quercifolia*, 4' to 6', sum., hdy. against walls in southern counties, grh., wh.
- scandens* (near to, or *syn.* of *petiolaris*).
- Thunbergii*, 2' to 3', sum., hlf-hdy., bl. or ro.



HYDRANGEA HORTENSIA.

Excellent results have also been obtained by French growers by growing the plants in a compost of one-third loam, one-third peat, and one-third coal ashes. *Paniculata hortensis* is not as a rule forced so easily as *Hortensia* and its varieties, but is allowed to come on more naturally. Also old plants are more frequently grown than single-stemmed ones, the latter system being almost exclusively applied to *Hortensia* and its varieties. What pruning is

HYDRASTIS.

Hardy herbaceous perennial (*ord.* *Ranunculaceæ*), somewhat difficult to manage. It is propagated by division of the root in spring, and it is well to plant the divisions in sandy soil in a warm corner of the garden by themselves, in order to give them a start. Soil, loam and leaf mould in equal parts, with sand. Ordinary garden soil will not do.

Principal Species :—

canadensis, 1', My., Je., hdy., grn., wh. Orange Root.

HYDROCHARIS. (THE FROG BIT.)

The only species in this genus (*ord.* Hydrocharidæ), *Morsus-ranæ*, is a curious aquatic that is fairly common in shallow, muddy waters in Britain. It has no horticultural value.

HYDROLEA.

Greenhouse herbs and sub-shrubs, all American (*ord.* Hydrophyllacæ). The flowers are all of some shade of blue, and in shape like those of *Campanula isophylla*. Propagation, by division and cuttings. A damp, almost boggy situation and rather peaty soil are necessary.

Principal Species :—

caroliniana, 1' to 2', sum., hdy. (*syn.* quadrivalvis). quadrivalvis (*see* caroliniana).
corymbosa, 1' to 2', sum., hdy., sepals hairy. spinosa, 1', Je., Jy., hdy., pale bl.

HYDROPHYLLUM.

A small genus (*ord.* Hydrophyllacæ) of hardy perennial herbs of little horticultural value.

HYGROMETER.

Literally a water measurer; an instrument for ascertaining the amount of moisture in the air. A dry and wet bulb thermometer is the instrument that is generally in use. The "wet" bulb is covered with a piece of muslin connected with a few strands of woollen material, of which one end is hanging in a small vessel of water attached to the thermometer stand. This vessel is placed a few inches away from the mercury tubes, so that evaporation may not influence the expansion. The degree of humidity is learned by comparing the readings of the dry and the wet bulbs with special hygrometrical tables compiled for use with dry and wet bulb thermometers. For practical purposes the hygrometer is not much employed by gardeners. Almost the only instance of its daily use is in the case of Filmy Ferns, which need to have the atmosphere almost at saturation point. Even then a practical man can tell at a glance by the appearance of the stones and the walls of the cases whether the conditions are moist enough, without reference to the hygrometer.

HYMENÆA. (LOCUST TREE.)

Ornamental stove evergreen trees (*ord.* Leguminosæ) with comparatively large, white flowers. Cuttings of ripened shoots will root in sand in spring if given plenty of bottom heat. The plants are rarely cultivated.

Principal Species :—

Courbaril, 40' to 60', yel., furnishes resin.

HYMENANDRA.

A genus of one species (*ord.* Myrsinæ) of stove evergreen shrubs with handsome foliage. Propagation, by cuttings of the young shoots, taken off with a heel of the old wood in spring, and rooted in heat. Soil, loam two parts, leaf mould one part, and sand.

Only Species :—

Wallichii, 2' to 4', st., pk.

Hydromestus (*see* *Aphelandra*).

Hydroplitis (*see* *Brasenia*).

HYMENANTHERA.

Greenhouse and half-hardy shrubs (*ord.* Violariæ) of stiff habit, with small flowers. They are rarely cultivated. *Crassifolia* is a neat hardy shrub.

HYMENOCALLIS.

Description.—Stove and greenhouse bulbous plants (*ord.* Amaryllidæ), with thick leaves and usually white, fragrant flowers. They are allied closely to *Pancratiums*; indeed, some of the species commonly cultivated as *Hymenocallis* are in reality *Pancratiums*, and *vice versa*.

There may be said to be three sections in the genus, one needing stove treatment, the second flourishing in the greenhouse, and the third being almost hardy. The last, to which the name of *Ismene* is sometimes given, will, however, only do in sheltered positions in the southern counties. They may be lifted, and the bulbs stored in sand for the winter.

Propagation.—By offsets, which are produced from the larger and older bulbs. These should be carefully separated at potting time, and grown on in sandy soil in a close frame.

Soil.—Good loam two parts, rotten cow manure one part, and leaf mould one part, with sand. Pot rather loosely.

Other Cultural Points.—The bulbs do not need potting often; once in two years is enough, but an annual top-dressing of new soil is helpful. The stove and greenhouse bulbs must always be kept moist, even in winter. Mealy bug is the worst pest. Remedy, the sponge.

Principal Species :—

calathina, Mch., Ap., grh., greenish wh., very sweet (*syn.* *Pancratium calathinum*).
macrostephana, 2', Feb., st., wh., sweet.
ovata, 1' to 2', Oct., st., wh., fragrant (*syn.* *amœna* and *Pancratium amœnum* of *Botanical Magazine* 1467, *P. fragrans*, and *P. ovatum*).
speciosa, 1' to 1½', st., wh., sweet (*syn.* *Pancratium speciosum* of *Botanical Magazine* 1453).

Other Species :—

Amancaes, 2', grh., yel. (*syn.* *Pancratium Amancaes* of *Botanical Magazine* 1224).
andreana, 1½', wh. (*syn.* *Ismene andreana*).
deflexa, st., said to be a natural hybrid (*syn.* *Choretis* and *Ismene deflexa*).
expansa, 2', Nov., st., grn., wh. (*syn.* *Pancratium expansum* of *Botanical Magazine* 1941).
harrisiana, 1', Je., grh., wh.
lacera, 1½', My., grh., wh. (*syn.* *rotata* and *Pancratium rotatum* of *Botanical Magazine* 827).
macleana, 2', Je., nearly hdy., grh., wh., grn. (*syn.* *virescens* and *Ismene macleana* of *Botanical Magazine* 3675).
tubiflora, st. (*syn.* *Pancratium guianense*).
undulata, 1', Ap., st., wh. (*syn.* *borskiana*).

HYMENODICTYON.

Stove trees (*ord.* Rubiacæ) with small flowers, of no garden value.

HYMENOPHYLLUM. (FILMY FERNS.)

Description.—Stove, greenhouse, and hardy Ferns (*ord.* Filices), the delicate, semi-transparent appearance of whose fronds has led to their being described as Filmy Ferns. There are upwards of eighty species, chiefly requiring stove and greenhouse treatment. Two are British, viz. *unilaterale* and *tunbridgense*, but even these

Hymenodium (*see* *Acrostichum*).

Hymenolepis (*see* *Acrostichum*).

require the shelter of a case, unless the locality has a very moist climate.

Propagation.—This is a slow and tedious operation. Plants are rarely raised from spores, although spores are produced freely by the plants. A better method is division of the wiry rhizomes, with which all the species are provided, but even this is slow, and not always sure.

Soil.—Sandy peat, live sphagnum moss, chopped, and small pieces of sandstone, with sand, for the pot plants. In many cases, however, the plants grow upon blocks of coarse, fibrous peat or portions of tree roots, and need no soil beyond a little packing of sphagnum, with perhaps a little peat.

Other Cultural Points.—Hymenophyllums must have the atmosphere constantly moist, almost at saturation point, as described under FERNS (FILMY), which *see*. Close cases are therefore necessary, and only soft, not hard, water should be used for damping down and watering. Although so delicate, Hymenophyllums will stand London smoke much better than many other Ferns.

Principal Species :—

- aruginosum*, fronds 2' to 3' long, 1' broad, downy, st.; does well on sandstone.
caudiculatum, fronds 6' to 15' long, 2' to 3' broad, st.; for peat block.
chilense, fronds 2' by 1', dark grn.
ciliatum, fronds 2' to 6' long, 1' to 2' broad, hairy, st.; for Tree Fern block (*syns.* *boryanum* and *Plumieri*).
demissum, fronds 4' to 12' long, 3' to 4' broad, triangular, grh.
dichotomum, fronds 4' to 6' by 2' to 3', much cut and crisped.
flexuosum, fronds 10' to 12', crisped, formerly classed as a var. of *javanicum*.
hirsutum, fronds 2' to 6' long, $\frac{1}{2}$ " broad, st.; good for a wood or Fern block.
pectinatum, fronds 3' to 6' by $\frac{1}{2}$ " to $1\frac{1}{2}$ ".
 — *superbum*.
polyanthos, fronds 2' to 8' long, 1' to 3' broad, st. (*syn.* *protrusum*).
Blumeianum is a var.
pulcherrimum, fronds 6' to 12' long, 4' to 6' broad, triangular, grh.
tricoideum, grh. (*see* figure).
tunbridgense, fronds 1' to 3' long, $\frac{1}{2}$ " to 1" broad, grh., hdy., British; good for a block of sandstone or Tree Fern stump.
 — *Wilsoni* (although described as a var. of *tunbridgense* by the *Kew Hand-List*, some authorities make *Wilsoni* synonymous with *unilaterale*).
unilaterale, close to *tunbridgense*, but stiffer; grh., hdy., Britain.

Other Species :—

- abruptum*, fronds 1' long, $\frac{1}{2}$ " broad, st. (*syn.* *brevifrons*).
asplenioides, fronds 4' long, 1" broad, st.
bivalve, fronds 3' to 8' long, 2' to 3' broad, grh.
boryanum (*see* *ciliatum*).
brevifrons (*see* *abruptum*).
crispatum (*see* *javanicum*).
dilatatum, fronds 6' to 12' long, 4' to 6' broad, grh.
falklandicum, fronds 1' to $\frac{3}{4}$ " long, grh.
fimbriatum (*see* *javanicum*).
flabellatum, fronds 4' to 12' long, 2' to 4' broad, grh. (*syns.* *nitens* and *nitidum*).
hirtellum, fronds 3' to 6' long, 2' to 3' broad, st., hairy.
javanicum, fronds 4' to 8' long, 3' to 4' broad, grh. (*syns.* *fimbriatum* and *tasmanicum*).
nitens (*see* *flabellatum*).
Plumieri (*see* *ciliatum*).
protrusum (*see* *polyanthos*).
rarum, fronds 2' to 6' long, 1' to 2' broad, grh.
scabrum, fronds 1' to $1\frac{1}{2}$ " long, 3' to 5" broad, grh.
sericeum, fronds 6' to 24' long, 2' to 3' broad, st., hairy; good for sandstone block.

HYMENOPTERA.

A large order of insects with four membranous wings and powerful jaws. Among them are to be found many of the most common insects, and garden friends and foes are both included. The Tenthredinidæ, or Sawflies, belong to the latter section. These prey upon the Willows and Roses particularly, the female insect having a sharp, saw-like instrument to enable her to bore a secure resting-place for the eggs. The larva is actually the destructive stage, but Sawflies must be attacked strongly in the perfect insect stage if the plants are to be saved. In another section is placed the Ichneumon fly, which, being a parasite upon the larvæ of other flies, is a



HYMENOPHYLLUM TRICOIDEUM.

friend to the gardener. The Gallflies (Cynipidæ), which cause the galls upon Oaks and Roses, are also to some extent parasites, their larvæ preying upon other insects. Then there is a section of stinging insects, and here the honey bee, humble bee, hornets, wasps, and ants are placed, so that this is a very important section. Ants alone are a host, and they are remarkable for the way in which their communities are organised. Perfect male insects such as the drone of the bee, perfect females like the queen bee, and imperfect females such as the worker bees, are found in this section. To speak generally, humble bees and honey bees are friends to the gardener, and wasps, hornets, and ants are enemies. More information will be found under the headings of BEES, GALLS, ICHNEUMON FLIES, and SAWFLIES.

HYOPHORBE.

A small genus (*ord.* Palmæ) of handsome stove Palms, easily grown, but not frequently met with

in collections. They have large leaves, which in the young state are often tinged with purple maroon. Propagation, by seeds. Soil, loam three parts and cow manure one part, with sand. Pot firmly.

Principal Species :—

Verschaffeltii, lvs. 4' to 6' long, midribs wh.

Other Species :—

amaricaulis, lvs. 4' to 6' long, trunk and petioles pur. maroon, midribs lined orange. *commersoniana* (see *Chrysalidocarpus lutescens*). *indica*, 40' to 50', trunk 4' to 6" in diameter).

HYOSCYAMUS. (HENBANE.)

A small genus (*ord.* Solanaceæ), and of no value horticulturally. All the plants in it are herbs, biennial or perennial, and most of them have poisonous properties. Niger, the Henbane, a native of Britain, is used medicinally, and in the Middle Ages was one of the witch's herbs. Propagation, by seeds and root division. Light, rich soil is best.

Principal Species :—

niger, 1' to 2', sum., hdy., dull yel., veined pur.; often found on rubbish heaps and waste ground.

HYOSPATHE.

Stove Palms (*ord.* Palmæ) with slender stems of Reed-like appearance, and small, green flowers. Propagation, by imported seeds. Soil, good loam two parts, rotted cow manure one part, and one-eighth of the whole grit.

Principal Species :—

elegans, lvs. 3' to 4' long; used for thatching.

HYPECOUM.

Hardy annual herbs (*ord.* Papaveraceæ), of which only one species, procumbens, is at all frequently cultivated. Propagation, by seed, which may be sown outdoors at the beginning of April, for flowering the following summer. For blooming in spring, sow in the previous autumn. Any ordinary garden soil will do, but a sunny position is best.

Principal Species :—

procumbens, 1', spr., sum., hdy., yel.

HYPERICUM. (ST. JOHN'S WORT.)

Description.—A showy and attractive genus of perennial, herbaceous, sub-shrubby, or shrubby nature (*ord.* Hypericinæ), to which have been attached several interesting legendary associations. There are said to be upwards of 170 species, so that only a portion of them can be named. Some are suitable for the shrubbery and border, while the dwarfier forms are charming plants for rockwork. The flowers of all the Hypericums are yellow.

Propagation.—The shrubs, and a number of the others, can be propagated by cuttings, removed in spring or summer, and struck in light, sandy soil in a greenhouse or frame, or under a hand-light. The herbaceous species are propagated by division, and all may be grown from seeds sown in a frame or in pots in a greenhouse, and pricked out a few inches apart when large enough to handle.

Soil.—Any good loamy soil for the larger species, and a lighter one of loam, sand, and leaf soil for the Alpines.

Other Cultural Points.—The greater number are hardy, but some of the sub-shrubs should occupy a sheltered position, where they are not exposed to

cold winds. Several grow well under the shade of trees, and calycinum is occasionally used as a cover plant for game, or for covering bare spots in parks.

Principal Species, Hybrid, and Varieties :—

Androseum, 3', sum.; a fine sub-shr. with dark fruit; var. *aureum*. *lutsan*, Sweet Amber. *calycinum*, 1', Je., shr. Rose of Sharon. *Coris*, 9", My.; a little tender. *hookerianum*, 2' to 4', Jy., shr. (*syn.* *oblongifolium*, see figure). *moserianum*, 1½' to 3', sum.; a fine hybrid (*calycinum* × *patulum*). — *tricolor*, variegated lvs. *nummularium*, 6", Je.; neat Alpine. *patulum*, 5', Jy., shr. (*syn.* *uralum*). *reptans*, 3", Je.; Alpine trailer.



HYPERICUM HOOKERIANUM.

Other Species :—

ægyptiacum, 1½', Je. *ascyron*, 3', Jy., herbaceous. *St. Peter's Wort*. *aureum*, 3', Jy., shrubby. *balearicum*, 1½', Ap., grh., ev. shr. *chinense*, 3', Je., hlf-hdy. shr. (*syns.* *monogynum*, *L.*, and *sinense*). *densiflorum*, 5', Jy., hdy. shr. (*syn.* *fasciculatum* of gardens, not Lam.). *elatum*, 6', Jy., hdy. shr. *elegans*, 1', Jy., herbaceous. *Elodes*, 6', Jy. Marsh H. *empetrifolium*, 1', Jy., hlf-hdy. herbaceous. *hircinum*, 3', Aug., hdy. shr. *hirsutum*, 2', Jy., herbaceous. *humifusum*, trailer, Jy., herbaceous. *hyssopifolium*, 1', Jy., herbaceous. *japonicum*, 1', Je., herbaceous. *kalmianum*, 3', Je., hdy. shr. *montanum*, 1½', Jy., herbaceous. *nepalense*, 2', Jy. *olympicum*, 1½', Jy., hlf-hdy. ev. *orientale*, 1', Jy., hlf-hdy., herbaceous. *perforatum*, 2', Jy., herbaceous. *prolificum*, 1½', Jy. (*syn.* *kalmianum* of gardens, not L.), hdy. shr. *pulchrum*, 1½', Je. *pyramidalum*, 3', Jy. *repens*, trailer, Je., herbaceous. *Richeri*, 9", Jy., herbaceous; var. *Burseri*.

Hyperanthera (see *Moringa*).

Hypericopsis (see *Kranlenia*).

HYPHÆNE. (DOOM, DOUM, or GINGER-BREAD PALM.)

Fan-leaved Palms (*ord.* Palmæ), needing a stove temperature. Thebaica is the principal species in cultivation, and even this is not at all common. The stem is noticeable for its branching habit, quite unique amongst Palms. The wood is very hard, and is employed in Upper Egypt and Nubia for making domestic utensils. Propagation, by seeds, which have to be imported, and are sometimes very slow and irregular in germination. Soil, loam two parts, well-rotted cow manure one part, and road scrapings one-sixth.

HYPOCALYMNA.

Greenhouse evergreen shrubs (*ord.* Myrtaceæ). Cuttings of the young shoots may be rooted in spring in a close frame, and the plants do best in loam two parts, peat one part, and sand.

Principal Species :—

angustifolium, 3', My., suave of *Botanical Register* 1844, 28).
grh., wh. or pk. (*syn.*)
robustum, 2', My., grh., pk.

HYPOCALYPTUS.

A genus of three species only (*ord.* Leguminosæ), several species formerly included in it being now referred to *Podalyria*. *Oboordatus* is an ornamental evergreen shrub, that may be increased by cuttings of the side shoots in April in a close frame, without much heat. Soil, peat and loam in equal parts, with one-sixth of sand.

Principal Species :—

obcordatus, 1' to 2', Je., Jy., grh., pur. (*syn.* *Crotalaria purpurea* of *Botanical Magazine* 3894).

HYPOCYRTA.

Stove shrubs (*ord.* Gesneraceæ), about ten species in all. Not much cultivated. They answer to the same cultural treatment as *Gesneras*; in brief, propagation by cuttings rooted in heat, and for soil, loam and leaf mould in equal parts, with sand.

Principal Species :—

glabra, 8" to 10", Je., strigillosa, 2', My., sc., Jy., sc., yel., stems pur. yel., solitary.

HYPODERRIS.

A small genus (*ord.* Filices) of two species of stove Ferns, closely allied to *Woodsia*. They are of easy culture, may be raised from spores, and like a compost of one part of loam and two parts of sandy peat, with plenty of water during the summer. They like a deeper shade than most Ferns, and do well planted out in the warm fernery.

Only Species :—

Brownii, fronds 10" to 12" long, ev. *Seemannii*, fronds 1½' long.

HYPOESTES.

A rather large genus (*ord.* Acanthaceæ) of stove herbaceous perennials and evergreen shrubs, not often grown. They need similar cultural treatment to *Jacobinias* and *Justicias*.

Principal Species :—

sanguinolenta, 6" to 12", pale pur., wh., herbaceous.

Other Species :—

aristata, 2' to 3', Feb., ro., involucrata, 1½', Jy., Aug., wh. pur., herbaceous.
purpurea, 2', My., Je., pur., herbaceous.

Hypodematium (*see Lissochilus*).

HYPOLEPIS.

Stove and greenhouse Ferns (*ord.* Filices) closely related to *Cheilanthes*, but stronger growing, and with creeping rhizomes. The latter afford a capital method of propagation, for very small divisions will grow. Spores also germinate freely, and the plants grow quickly; indeed, *Hypolepises* are apt to become weeds in the fernery, and choke up sporlings of more tender kinds. Some of the species, notably *repens*, make elegant basket plants. Soil, loam and leaf mould in equal parts, with sand. Of insect pests snowy fly is the worst, and once it gains a footing, it is difficult to get rid of.



HYPOXIS HEMEROCALLIDEA (*see p. 437*).

Principal Species :—

bergiana, fronds 1' to 1½' long, 6" to 9" broad, stems woolly, grh. of *Asplenium Filix femina*.
repens, fronds 3' to 4' long, pendent, much cut, st., grh.; good for baskets or rustic work.
distans, fronds 12" to 15" long, 4" to 5" broad, grh., resembles a var.

Other Species :—

amaurorachis, fronds 3' long, 2' broad, grh. good for baskets; a pretty, lace-like Fern.
anthriscifolia (of gardens, not *anthriscifolia* of Preslau), fronds 6" to 7" long, nearly hdy., *nigrescens*, fronds 1' long, 6" broad, st.
radiata (*syn.* *Adiantopsis radiata*, now *Cheilanthes radiata*).

HYPOLYTRUM.

Sedge-like plants (*ord.* Cyperaceæ) of little horticultural value, save the stove species *latifolium*. It may be propagated by seeds, or by cuttings taken whenever they can be obtained, and it revels in plenty of heat and moisture. Soil, sandy loam and peat in equal parts. All the species of *Hypolytrum* are tropical or sub-tropical.

Principal Species :—

latifolium, 2' to 4', st., br., in thick terminal clusters ; an elegant foliage plant.

HYPOXIS.

A little grown genus (*ord.* Amaryllideæ) of bulbous plants. Propagation, by division. Soil, sandy loam.

Principal Species :—

hemerocallidea, yel. (*syn.* *elata*, see p. 436).

IBBETSONIA.

A greenhouse shrub (*ord.* Leguminosæ) from South Africa, requiring treatment similar to the species of *Cytisus*. Propagation, by cuttings of the half-mature wood in sandy loam and peat under a bell-glass. Loam and peat with less sand will suit the plants. *Genistoides* has now been united with *Cyclophia*.

IBERIDELLA.

Perennial herbs (*ord.* Cruciferae), often inclined to be sub-shrubby or woody at the base. Propaga-



Photo: W. H. Waite, Edinburgh.

IBERIS SEMPERVIRENS SUPERBA (see p. 438).

HYSSOP.

An evergreen shrub of bushy habit, the *Hyssopus officinalis* of the botanist, which *see*. The plant has aromatic properties, and was at one time much in favour as an ingredient in herb potions, which it was the practice of every housewife to brew. The flowers and tops of the shoots are even now sometimes used in the manufacture of an expectorant.

HYSSOPUS.

There is one species only in this genus (*ord.* Labiatae). *Officinalis*, which is used medicinally, has blue, red, or white flowers—these are the three varieties—and blossoms from June to September. It is quite hardy and evergreen, 1' to 2' in height, and is sometimes employed as a bedding plant. It may easily be raised from seeds or cuttings, sown or inserted in spring, in light sandy soil. Any ordinary garden soil will suit it, and occasionally it is to be found flourishing in cottage gardens with the scantiest attention.

tion, by seeds and cuttings, the hardy species under a hand-light or cold frame in summer, the more tender species in a greenhouse. Any friable garden soil will suit the hardy species, which should be planted on a rockery.

Principal Species :—

rotundifolia, 3" to 4", Ap., ro. lil., yel.

IBERIS.

Description.—A most interesting genus of annual, biennial, or perennial herbs, or sub-shrubby evergreens (*ord.* Cruciferae). Flowers white, pink, or purple.

Propagation.—The annual and biennial species by seeds in March and April, the hardy ones where they are to bloom. *Umbellata* and its varieties

Iantha (see *Ionopsis*).

Ianthe bugulifolia (see *Celsia*).

Ianthe (of Salisbury, see *Hypoxis*).

Ibatia (see *Lachnostoma*).

may also be sown at the beginning of August, to stand the winter in the open, and bloom during April and May. The other species may be increased by seeds, but the evergreens are mostly propagated from cuttings in sandy soil, almost any time after flowering, and placed under a hand-light or cold frame with a northern aspect during the summer months. Give shade during the day.

Soil.—The hardy species will thrive in any friable garden soil that is well drained. *Gibraltarica* should be potted in fibrous loam, with a third of leaf soil and plenty of sand to keep it porous.

Other Cultural Points.—Annuals like *amara*, and *umbellata* and its varieties, are suitable subjects for beds or masses in the mixed border, sowing in August, and again in March and April for a succession. *Saxatilis* and *semperflorens* flower very early if the weather is favourable, and they, as well as *sempervirens*, *tenoreana*, and *Pruiti*, are most at home on the rockery, where they are kept relatively dry in winter, and make a fine display drooping over the ledges, *sempervirens*, its superb variety *garrexiana*, and *corifolia* being well adapted for this purpose. The last named is the latest and best flowering evergreen species. *Sempervirens*, *semperflorens*, and *corifolia* are the best for the herbaceous border. *Gibraltarica* should be grown in a cool greenhouse or sheltered spot.

Principal Species and Varieties :—

<i>amara</i> , 6" to 12", Je., ann. wh.; many good garden vars.: Common Candytuft.	— Climax.
— <i>spiralis</i> .	— Little Gem.
<i>corifolia</i> , 3" to 6", Je., hdy. ev., wh.	— Perfection.
<i>gibraltarica</i> , 1', My., grh., wh., pk.	— <i>superba</i> (see p. 437).
<i>saxatilis</i> , 6", Mch. to My., hdy. ev., wh.	<i>tenoreana</i> , 6" to 12", Je., hdy., pale pur.
<i>semperflorens</i> , 1' to 1½', Mch. to My., hdy. ev., wh.	— <i>petraea</i> , wh., tinged red, pretty for rock-work.
<i>sempervirens</i> , 9" to 12", My., hdy. ev., wh.	<i>umbellata</i> , 1', Je., Jy., hdy. ann., pur.
— <i>garrexiana</i> , flowers much larger (see figure).	— <i>atropurpurea</i> , dark pur.
	— <i>carnea</i> , flesh.
	— <i>nana purpurea</i> , dwarf pur.
	— <i>purpurea lilacina</i> , lil. pur.

Other Species :—

<i>ciliata</i> , 9", Je., bien., wh.	<i>Pruiti</i> , 6" to 9", My., wh.
<i>gibraltarica hybrida</i> , wh., ro. pur.	<i>pubescens</i> , 6", Je., pale vio.
<i>intermedia</i> , 1', Je., bien.	<i>pumila</i> (now <i>Thlaspi pumilum</i>).
<i>lagascana</i> , 1', Je., ann.	<i>stylosa</i> (see <i>Nocca</i>).
<i>nana</i> , 4", Je., ann., pur.	<i>violacea</i> , 3" to 4", Je., pur.
<i>odorata</i> , 1', Je., ann.	
<i>pectinata</i> , 1', Je., wh.	

ICACINA.

A small genus of stove shrubs (*ord.* Olacineæ), of which only one species, namely *Mannii*, seems to have been introduced. It has a large, tuberous root, slender, climbing stems, and small, pale yellow flowers in dense, axillary clusters. Propagation, by cuttings in sandy loam in a propagating case, with bottom heat. Soil, fibrous loam, leaf mould, and a fair proportion of sand. It flowers in October.

Ididium (see *Spiranthes*).
Iceco (see *Chrysobalanus*).
Icecorea (see *Ardisia*).
Icaranda (see *Jacaranda*).

ICHNEUMON FLIES.

This name is applied to a large section of insects (*Ichneumonidæ*) the larvæ of which are, in many instances, parasitic in the bodies of other insects. The ichneumons have four wings and long, slender bodies, the abdomen of which is connected with the rest by a slender, stalk-like joint as a rule, from which they may be recognised. As the ichneumons are destructive to the enemies of the gardener, they should be encouraged. Aphides recognise their enemy, and become greatly agitated, but the female ichneumons manage ultimately to pierce the green fly and deposit an egg in its body. Large numbers of aphides, dead, pale brown, sticking to leaves, with a small hole in the



Photo: Cassell & Company, Ltd.

IBERIS SEMPERVIRENS GARREXIANA.

inflated shell, may be found, indicating that the larva of the ichneumon has become fully fed in its victim and escaped. Most or all insects have their particular enemy belonging to this order of flies. *Microgaster glomeratus*, the parasite of the Large White Cabbage Butterfly, lays a large number of eggs in the body of the caterpillar, and when the latter should be about fully grown it sickens if it has been victimised, and instead of changing to a pupa, dies as a large cluster of yellow cocoons of the ichneumon are seen to emerge from its side.

ICHNOCARPUS (*syn.* AGANOSMA).

A genus of stove twiners (*ord.* Apocynaceæ). Propagation, by short lateral shoots in sand placed under a bell-glass in stove heat during the early part of the season. Soil, loam, peat, and sand.

Ice Plant (see *Mesembryanthemum*).
Iceica (see *Bursera*).
Ictodes (see *Symplocarpus*).

Principal Species :—

acuminatus, wh. elegans, pur.
 caryophyllatus, Oct., pale frutescens, 10', Jy., pur.
 yel.

IDESIA.

A hardy tree (*ord.* Bixineæ) with leaves somewhat similar to those of a Lime, but more leathery,



Photo: Cassell & Company, Ltd.

ILEX AQUIFOLIUM AUREA REGINA, THE GOLDEN QUEEN HOLLY (*see p. 440.*)

heart-shaped, and handsome. The large, yellow flowers are produced in very long terminal or sub-terminal branching racemes. *Polycarpa* (*syns.* *Flacourtia japonica* and *Polycarpa Maximowiczii*) is propagated by imported seeds sown in gentle heat; also, with some difficulty, by cuttings in heat during spring or autumn. Any good garden soil will suit it. The flowers are followed by orange berries about the size of a Pea.

ILEX. (HOLLY, *syn.* PRINOS.)

Description.—Hardy and tender trees and shrubs (*ord.* Ilicineæ), with leathery, evergreen leaves (decidua being one exception to this) mostly entire, less often cut, and seldom so spiny as in the Common Holly (*Aquifolium*) and the variety named *ferox*. Flowers hermaphrodite or often male and female in *Aquifolium*, white, except in *Perado*, which has white, pink, or reddish flowers, followed usually by red berries.

Propagation.—By the berries, which should be stratified in layers of sand for a year till the pulp rots and the bony case enclosing the seed softens, after which they may be sown thickly in lines in prepared beds in March. Grafting and budding in July are adopted for the increase of varieties, and cuttings of ripened young shoots taken in the autumn may be inserted in prepared soil on a north border and covered with frames or hand-lights till

Idothearia (*see Drimia*).
Ignatia (*see Strychnos*).

they take root. But a quicker and more certain method is to take cuttings in July of wood which is just becoming firm.

Soil.—Hollies grow in a great variety of soils—loamy, chalky, gravelly, or sandy, provided they are well drained. Any friable garden soil will meet their requirements. Land of a poor or hungry nature may be improved by means of well-rotted manure, or fresh soil of good staple. Tender species may be planted in friable, fairly rich, and well-drained soil.

Other Cultural Points.—The Common Holly is pruned in various ways to form round-headed, conical, or pyramidal specimens, the two former methods being adopted in small gardens to limit its size, the variegated forms being the more frequently treated in this way. The loose pyramidal form is the best for large specimens. The Common Holly makes very durable and impenetrable hedges, but here, as in all other cases, the knife, rather than the shears, should be employed, as cut leaves are very unsightly and often die. Pruning should not be resorted to for the purpose of hastening the rate of growth, and the leader of those intended for trees should not be cut. Hollies transplant badly after they attain to some size, and the operation is best accomplished during April or September. Dull, showery weather should be selected for the operation, and the trees should be frequently syringed until the roots have



Photo: Cassell & Company, Ltd.

ILEX CRENATA (*see p. 440.*)

got a firm hold of the soil. Large specimens or trees should always be lifted with a good ball of soil, even if it is necessary to employ a proper transplanting machine for the purpose. The fresh holes should be ready before the trees are lifted; and mats should be tied round the ball to keep the soil intact. Fill the space round the roots with good

soil, and when the hole is half full, tread firmly and give a good soaking with water. When this has settled down complete the filling, but leave a basin for future watering, and stake the tree firmly before leaving it.

Principal Species and Varieties :—

- Aquifolium, 20' to 30', My., Je., hdy. Prickly-leaved or Common Holly.
- altaclarensis, broad, thin, flat.
- angustifolia, narrow.
- argentea marginata, long, narrow, edged silver.
- argentea medio-picta, centre wh. The Silver Milkmaid.
- argentea pendula, wh. edge, pendulous. Perry's Weeping.
- argentea regina, silver edge. Silver Queen.
- atrovirens, dark grn.
- aurea angustifolia, narrow, golden edged.
- aurea marginata, yel. edges.
- aurea medio-picta, centre yel. Gold Milkmaid.
- aurea pendula, yel., pendulous. Waterer's Gold Weeping.
- aurea regina, broad yel. edge (see p. 439). Golden Queen.
- balearica, oval, with few teeth. Minorca Holly.
- ciliata, small, prickles like hairs.
- ciliata major, larger.
- crassifolia, thick, fleshy, deeply cut.
- donningtonensis, lanceolate. Habit pyramidal.
- ferox, edges rolled back, surface prickly. The Hedgehog Holly.
- ferox argentea, silvery variegation.
- ferox aurea, yellow variegation.
- flavescens, yellowish. Moonlight Holly.
- fructu-luteo, fruit yel.
- fructu-nigro, fruit blk.
- hands-worthensis, spiny, creamy edge. Handsworth New Silver.
- Hendersoni, broad, entire.
- heterophylla, various shapes.
- Hodginsii aurea, broad gold margin.
- integrifolia, spineless, thin.
- latifolia aureo-marginata, broad, edged yel.
- laurifolia, like Laurus nobilis.
- laurifolia longifolia, longer.
- lawsoniana, blotched yel.
- maderensis variegata, gold blot in centre.
- marginata, without prickles, broad, thick margin.
- myrtifolia, small.
- pendula, weeping, grn.
- platyphylla, broad, spines variously scattered.
- scotica aurea, broad golden edge, nearly entire.
- watereriana, dwarf, golden.
- whittingtonensis, spines numerous, stiff. Plant elegant.
- cornuta, three-horned, shr. crenata, small (see p. 439).
- major, larger.
- latifolia, large; best on a wall.

Perado, obovate, mostly entire. The Perado Holly.

quercifolia, toothed, dull dark grn.; one of the hardiest of exotic Hollies (*syn. opaca*). American Holly.

Other Species and Varieties :—

- Aquifolium aurea marginata bromeliifolia, edge yel., disc mottled.
- Cookii, grn., yel. edge.
- ovata, nearly spineless.
- recurva, spiny.
- Cassine, grh., berries bright red.
- Daboon, berries red.
- decidua, wedge shaped, shr.
- dipyrena, 12', Ap., My., berries br.
- glabra, wedge shaped, shr.
- insignis, 30' to 40', grh.
- laevigata, shr.
- paraguayensis, grh. Maté Tea.
- verticillata, My., Je., shr. Black Alderberry.
- Winterberry.

ILICIMUM.

Half-hardy shrubs (*ord. Magnoliaceæ*), some of which will succeed if trained against the low walls of hothouses or other buildings. Flowers red, yellow, or nearly white, fragrant, in the axils of the leathery leaves. Propagation, by cuttings of

mature wood in sand, under a hand-light in summer; also by layers from stools, in a cold pit, leaving them two years before cutting them from the parent. Soil, fibrous loam, peat, and sand. The half-hardy ones should have protection in winter.

Principal Species :—

- anisatum, 6', My., grh., religiosum, 3' to 4', Mch., red. Star Anise. hlf-hdy., yel. grn.
- floridanum, 3' to 8', My., hlf-hdy., red.

Other Species :—

- parviflorum, 6', My., grh., verum. True Star Anise. yel.



INCARVILLEA DELAVAYI (see p. 441).

IMANTOPHYLLUM (see CLIVIA). IMMORTELLE.

A French name given to the so-called everlasting flowers, which see.

IMPATIENS (BALSAM).

Description.—Hardy annuals, and greenhouse and stove biennials, and perennials (*ord. Geraniaceæ*), with purple, white, yellow, carmine, and red flowers. Stems succulent and brittle.

Propagation.—Hardy annuals by seed in the open border in April. Greenhouse and stove species by seeds in heat in March, or by cuttings in light sandy soil in heat at any time when required, those intended for preservation during winter being rooted in autumn.

Illairea (see *Loasa*).

Illanara Palm (see *Ptychosperma cunninghamiana*).

Illanara Pine (see *Podocarpus spinulosa*).

Imago (see *Insects*).

Imhofia (see *Hessea*).

Soil.—Any good garden soil will suit the hardy species. Biflora should be sown or planted on the margins of lakes, ponds, and streams. For stove species in pots use turfy loam, leaf soil, and sand, with plenty of well-rotted cow manure for the flowering pots.

Other Cultural Points.—Sultani, platypetala, flaccida, and others of that class may be planted in well-lighted borders in the greenhouse or conservatory. Hookeri is difficult to flower.

Principal Species and Varieties :—

amphorata, 3' to 6', Aug., hdy. ann., pale pur.	platypetala, 1½', sum., grh. or st., ro.
auricoma, 2', sum., st., yel.	Roylei, 3' to 6', sum., hdy. ann., pur. or wh.
Balsamina, 2', sum., st. or grh., sc., ro., wh. Common Balsam.	— macrochila, 8', hdy., pale pur.
flaccida, 1½', sum., grh. ann., pk. (<i>syn. latifolia</i>).	— pallidiflora, paler.
— alba, wh.	Sultani, 1½', sum., st., sc. Can be used for summer bedding.
Hawkeri, 2', sum., st., car.	— Episcopi, fine var.

Other Species :—

biflora, 3', Je., Aug., hdy. ann., or.	Mariania, 2', Je., st., pur.
capensis, 6'', Aug., grh., red, ann.	mastersiana, 1', Jy., st., pur.
chinensis, 1', Aug., grh., pur., ann.	mirabilis, 4', st., gold, yel.; should be kept dry during winter.
comorensis, 2', st., car.	mysorensis, 6'', Aug., yel., red.
discolor, 1', Aug., hdy., yel., ann.	pulcherrima, 1½', Jy., st., pur.
hookeriana, 2½', st., wh.	repens, 1½', Je., st., yel.
Jerdoniae, 9'', Je., grh., grn., red, yel., ann.	scapiflora, 9'', Aug., st., lil.
latifolia (<i>see flaccida</i>).	tripetala, 1', Aug., grh., red.
macrophylla, 2½', st., red, or.	
madagascariensis, 6'', Aug., grh., red, ann.	

INCARVILLEA.

Hardy annual and perennial herbs (*ord. Bignoniaceae*), requiring careful treatment, as several of them have not yet been properly tested as to hardness. Flowers rose, purple, or scarlet, funnel-shaped or tubular. Propagation, by seeds in a hotbed in March; also by division of the tufts or crowns, carefully effected so as not to destroy the crowns. An old knife is the best tool with which to divide them. The soil must be well drained, and light, but withal fertile, so as to encourage good growth while guarding against damping in winter. Most of them may be sheltered by planting them at the foot of walls, and Delavayi may have its crowns covered with ashes in winter when in exposed positions, such as on the rockery or herbaceous border. It is worthy of this attention, as it is the showiest species when strongly grown.

Principal Species :—

Delavayi, 2' to 2½', Jy., Aug., hdy., deep ro.; the best (<i>see p. 440</i>).	— grandiflora, ro., pur., wh. spots.
	Olge, 3' to 4½', Jy., Aug., hdy., pur.

• Other Species :—

arguta (<i>see Amphicoma arguta</i>).	sinensis, 1' to 2', grh., sc. tomentosa (<i>see Paulownia imperialis</i>).
compacta, 6'' to 12'', sum., ro. pk.	variabilis, 1½', Aug., ann., ro.
Koopmanni (<i>see Olge</i>).	

Impregnation (see Fertilisation and Hybridising).
Inarching (see Grafting).

INDIAN PINK (*see DIANTHUS*).

INDIARUBBER PLANT (*see FICUS ELASTICA*).

INDIGOFERA.

A large genus (*ord. Leguminosae*) of stove, greenhouse, and hardy trees, sub-shrubs, and herbs, mostly African. Several of the species yield the well-known dye, indigo. Propagation, by seeds, sown when ripe in heat according to the character of the species; also by cuttings of the young shoots inserted in sandy soil, any time during the summer. Soil, turfy loam, chopped but not sifted, two parts, leaf mould one part, with sand, and, for the stove species, a few pieces of charcoal. Decora is a pretty greenhouse shrub that flowers freely in summer if the previous year's growth be well ripened. It requires a rest in winter, and cutting back after flowering. Gerardiana does well in the open shrubbery, and better still on walls.

Principal Species and Varieties :—

australis, 3' to 4', Mch., Je., grh. sub-shr., ro. (<i>syn. sylvatica</i>).	pale red (<i>syns floribunda and atropurea</i> of gardens, and <i>Dosua</i> of <i>Botanical Register</i> , Vol. XXVIII, 57).
— alba, 3' to 4', sum., ev. shr., wh.; nearly hdy. against walls.	There is a wh. var.
decora, 3' to 4', sum., grh., red.	tinctoria, indigo, 4' to 6', Jy., st., red.
gerardianna, Jy., hdy. shr.,	

Other Species :—

Anil, 2' to 4', sum., st., pk.	<i>Dosua (see gerardianna).</i>
atropurea (<i>see gerardianna</i>).	<i>floribunda (of gardens, see gerardianna).</i>
	<i>sylvatica (see australis).</i>

INGA.

Stove trees and shrubs (*ord. Leguminosae*), of which very few are in cultivation, although there are upwards of 140 species. Propagation, by cuttings of the young shoots, taken in spring or early summer, and rooted in sandy soil, in a close frame, with bottom heat. Peat and loam in equal parts, with plenty of sand, suit. A good deal of water is needed in the growing season; little in winter.

Principal Species :—

dulcis (correctly <i>Pithecolobium dulce</i>).	macrophylla, 20', yel.; rare in cultivation.
	pulcherrima (correctly <i>Calliandra Tweediei</i>).

INOCARPUS.

Stove evergreen trees (*ord. Leguminosae*) of little decorative value and rarely cultivated.

Indian Berry (see Randia aculeata).
Indian Blue (see Nymphaea cyanea).
Indian Corn (see Maize and Zea).
Indian Cress (see Tropaeolum majus).
Indian Cup (see Sarracenia).
Indian Currant (see Symphoricarpos vulgaris).
Indian Fig (see Opuntia).
Indian Flowering Fern (see Helminthostachys).
Indian Garland Flower (see Hedychium).
Indian Grass (see Arundo).
Indian Hawthorn (see Rhamnus).
Indian Hill Guava (see Rhodomyrtus tomentosa).
Indian Lotus (see Nymphaea Lotus).
Indian Mallow (see Sida and Urena).
Indian Mulberry (see Morinda).
Indian Shamrock (see Trillium).
Indian Shot (see Canna).
Indian Wild Pepper (see Vitis trifolia).

INSECTICIDES.

In his struggles against insect foes the gardener has to depend largely upon the aid of various compounds, which experience has shown to be inimical to insect life, and which can, moreover, be used at a strength sufficient to kill the insects without endangering the life of the plants. Insecticides may be divided into three sections: (a) vaporisers, (b) powders, (c) liquids. Amongst the vaporisers tobacco plays a most important part. Not many years ago the burning of tobacco, tobacco paper, or tobacco rag was very commonly practised. Science has, however, found a method of liberating nicotine fumes in a more concentrated form. A still evening or early morning should be chosen. It is a wasteful practice to attempt to fumigate a house when even a moderate wind is blowing. Again, the rays of the sun pouring down on a closely shut up house for several hours raise the temperature within to a degree inimical to the health of the plants. Plants and houses which are to be fumigated should be as dry as possible.

Insecticides in the powder form are also in common use. They include tobacco powder, Hellebore powder, and flowers of sulphur, and they are best applied by means of a small blower or bellows, specially constructed, such as the Malbec. The leaves of *Pyrethrum roseum* and *P. cinerariifolium* are the base of a powder that is in common domestic use, but which is also effective when employed upon plants. For window plants, where only small quantities are required, ordinary snuff makes a capital insecticide. Flowers of sulphur is more commonly used as a fungicide, but insects do not like it.

All insecticides in the powder form should be syringed off the plants within a few hours of their application. This is especially to be noted in the case of Hellebore powder, which is a deadly poison, but which is one of the most effective weapons to use against the troublesome Gooseberry caterpillar. Tobacco powder is most commonly used for dusting in the points of the shoots of *Chrysanthemums*, *Carnations*, etc., that are attacked by green or black fly. If not washed out it injures the young, tender leaves.

Nowhere has the ingenuity of the gardener been displayed to better advantage than in the making of the numerous insecticides that are applied in liquid form. Not content with the various excellent proprietary preparations which are available, he has various recipes for making insect-killing mixtures at home. Of proprietary insecticides that may be said to have a world-wide fame, Fir-tree Oil, Lemon Oil, Gishurst Compound, and Nicotine Soap may be named.

Petroleum, popularly but erroneously called paraffin, is the sheet anchor of the home maker of insecticides. Unfortunately, it is not soluble in water, and needs some greasy matter, such as soft soap, to act as a vehicle for it.

A few recipes for home-made insecticides are given below:—

Kerosene Emulsion.—One pound of soft soap, 1 quart of soft water. Boil for half an hour. Take off the fire, add $\frac{1}{2}$ pint of petroleum; stir briskly. Add 8 gallons of water, churn with a syringe, and apply. This is effective against American Blight, black and green fly, red spider, Celery fly, and Onion fly.

An Ordinary Wash for Pot Plants.—Two ounces

of soft soap in 1 gallon of soft water. Use warm. This is useful for sponging Camellias, Indiarubber Plants, *Aspidistras*, etc.

Lime Wash.—Eight pounds of lime, 1 lb. of soft soap, 4 gallons of water, 2 oz. of size. This may be painted on the stems of fruit trees.

Paris Green.—One ounce of Paris Green paste, 4 oz. of soft soap, 20 gallons of water. Mix thoroughly, and keep constantly stirred. This is effective for Codlin Moth and Winter Moth caterpillars. Although it is a poison (an arsenical compound), and fruit growers are prejudiced against it on this account, no harm will result if the above quantities are used, and the mixture is kept constantly agitated during application. Apply just after the flowers have set, with a spraying machine. It should not be used when the fruit is getting mature.

Tobacco Water.—Four ounces of tobacco, 1 gallon of water. Apply warm with a sponge or syringe. Two ounces of soft soap may be added. Good for sucking insects.

A Winter Dressing for Fruit Trees.—Half a pound of caustic soda (Greenbank's 98 per cent.), $\frac{1}{2}$ lb. of commercial potash, 5 gallons of water. Spray, but keep off the clothes. This destroys moss and lichen as well as the insects they harbour.

Quassia Solution.—One pound of Quassia chips, 10 gallons of water, soaked for ten hours. Half a pound of soft soap may be added if desired, but this should be boiled in the water. Useful for black and green fly on any plants. It renders the plants distasteful to the fly, but does not kill the latter. Apply warm.

The Simplest Insecticide.—Hot water (132° temperature). Very few plants are injured by water at this temperature, and it has the advantage, besides its cheapness, of not clogging up the pores of the leaves.

Application of Insecticides.—An ordinary garden syringe suffices in most instances; but the Abol syringe and sprayer may be used where a very fine spray is desired. For fruit trees special engines are made, and some of them have an arrangement whereby the working of the pump sets in motion a set of churners inside. This is important where such substances as Paris Green are being employed. For the more costly insecticides, such as Lemon Oil, dipping is the most economical method. A wooden vessel is preferable to a metal one. After use the liquid may be strained through fine muslin to remove the dirt, and bottled up for further use.

All insecticides are more efficacious if applied warm than cold.

INSECTS.

Frequently the term "insect" is applied to all animals which have bodies exhibiting a row of joints. Thus woodlice, centipedes, spiders, mites, crabs, and even worms are included. Strictly speaking, however, insects are (a) animals possessing a jointed body, formed in three principal divisions, viz. the head, with its antennæ or feelers, the thorax, and the abdomen; (b) which breathe not by lungs, but by long tubes (tracheæ) running through the body and limbs; (c) and which during their life history pass through a series of changes. These stages may be named as follows: (1) the egg; (2) the larva or caterpillar; (3) the pupa; (4) the perfect insect, imago, or egg layer. Usually it is in the larval

stage that the ravages of insects are most to be dreaded, although it is obvious that in combating insects it is important to kill the perfect insects or egg layers. In a work of this scope it is impossible to deal with the various wonderful changes that go to make up the life of an insect; they would need a series of volumes to themselves. It may, however, be mentioned that frequently the larva is quite unlike the insect to which it will ultimately give rise, but that occasionally larva and perfect insect differ little except in point of size. The larvæ of bees and wasps are commonly called grubs. They show little trace of a head, such as is seen in caterpillars. The pupa stage is the quiescent one. It comes when the larva is fully fed and mature, and passes the winter usually in the ground enveloped in one of a variety of coverings. The larvæ of butterflies and moths are enclosed in a horny shell, which prevents almost all power of movement. In the case of the silkworm, the covering is a cocoon of what is known as silk.

In some of the aphides, multiplication by egg laying is supplemented by viviparous females throwing off perfect young flies in great numbers. The rapidity with which aphides increase is well known to all gardeners. While it is the larval stage that is the injurious one to plants in many cases, the aphides are harmful in their matured condition, for the flies suck the juices of plants. Beetles generally are furnished with strong jaws for biting, and they do much damage in this way.

In one respect at least, that of flower pollination, insects play a most important part in the world of plants. Many flowers have so developed themselves as to favour the class of insects which can assist their fertilisation, and the division of what the botanist calls "irregular" flowers has been developed in this way. Familiar instances are to be found in Delphiniums, Sweet Peas, and Orchids.

It must be confessed that, of the numerous insects with which the horticulturist and agriculturist come into contact, by far the greater number have to be reckoned as enemies. There are, however, some which do no harm, and others which are real friends. The latter, by reason of their being parasitic upon injurious insects, render good service to man. Chief among them may be mentioned the larvæ of the Ladybirds and the Lace-wing flies, which eat green aphides in thousands; also the Ichneumon flies. The gardener will do well to make himself acquainted with the appearance of these, and by every means in his power steer clear of hurting them. Other natural enemies of insects are birds, and, although some species of birds have an item on the debit side of the account for fruit stolen, still there is no doubt that they materially help to keep down the numbers of plant-feeding insects. Unless this were so, indeed, nothing would be able to live against the hordes of insects.

Artificial methods of keeping down insects include the use of insecticides (which *see*), the digging of the soil in the autumn so as to expose the pupæ to birds, and dressing with lime, gas lime, and other substances noxious to insects. In some cases the plan of removing and burning the top inch of soil beneath Gooseberry and Raspberry plantations is to be recommended, as many hundreds of pupæ are removed with the soil.

Insects, the class Insecta of the entomologist, are divided into the following principal orders:—

Coleoptera, or *Beetles*—These have powerful jaws fitted for biting. The larvæ of the Click

Beetle are the dreaded wireworms. Some of the ground beetles are friends, as they are insectivorous, but at least one of them, *Harpalus ruficornis*, is harmful, as it now preys upon Strawberries.

Orthoptera.—Cockroaches, Locusts, and Earwigs are included here. Chiefly enemies.

Neuroptera.—Friends and neutral. The Lace-wing flies are valuable allies of the gardener.

Hymenoptera.—Friends and foes. Among the former are the Ichneumons and Honey Bee, and amongst the latter the Sawflies, Gallflies, and Wasps.

Lepidoptera.—Enemies. The larvæ are caterpillars. The Onion fly, Crane fly, and Winter Moth belong here.



INULA GLANDULOSA (*see p. 444*).

Hemiptera, including *Heteroptera* and *Homoptera*.—Enemies. The Phylloxera, Scale, and Aphides belong here.

Mention will be made of the various important genera of insects under their names, and those of the plants they attack.

INULA.

Hardy herbaceous plants (*ord.* *Compositæ*), some of which have large, showy, yellow flowers, and bold, handsome leaves. All are of easy culture and vigorous habit, and will succeed where many other subjects fail. They are thus very suitable for the wild garden, and may with advantage find a place on the higher slopes of the rock garden, where they will serve as a screen for more tender plants. Propagation, by division of the roots in spring. Fairly large clumps may be easily

Ingenhoussia (*see Amphithalea*).

Ink Berry (*see Ilex glabra*).

Inoculation (*see Budding and Pollination*).

divided with a sharp spade. The divisions require no coddling, but may be planted straight away in their permanent quarters. Seeds also germinate readily. Any ordinary garden soil will suit, but the best heads are produced in rich, well-nourished ground. Mulchings of rotten yard manure, and occasional soakings with clear water and liquid manure, are helpful in the summer.

Principal Species :—

- | | |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| <i>ensifolia</i> , 9', Aug., Sep.,
yel. | <i>Hookeri</i> , 1' to 2', Sep.,
pale yel., slightly fragrant,
2½' to 3½' across; the best. |
| <i>glandulosa</i> , 2', Jy., Aug.,
yel. (see p. 443). | <i>Oculus-Christi</i> , 1½' to 2',
sum., yel., 3½' across. |
| <i>grandiflora</i> , 2', Jy., Aug.,
yel. | <i>salicina</i> , 2', Jy., Aug., yel. |
| <i>Helenium</i> , 3' to 4', sum.,
yel. Elecampane. | <i>squarrosa</i> , 1', Aug., yel.
(syn. <i>Bubonium</i>). |
| <i>hirta</i> , 1½', Jy., Aug., yel. | |

IOCHROMA (syn. *CHLENESTHES*).

Greenhouse trees and shrubs (*ord.* *Solanaceæ*), rarely cultivated except in botanic establishments. Do well under the same treatment as the florists' *Chrysanthemum*.

Principal Species :—

- | | |
|-------------------------------------------------|--------------------------------------------|
| <i>fuchsoides</i> , 4', Aug., Sep.,
or., sc. | <i>grandiflorum</i> , 4', Aug.,
Sep. |
| | <i>tubulosum</i> , 4', Aug.,
Sep., pur. |

IONIDIUM.

Herbs and sub-shrubs (*ord.* *Violariæ*) of little decorative merit, and seldom seen in cultivation. From the roots of the species *Ipecacuanha* is obtained the white *ipecacuanha* of commerce.

IONOPSIDIUM.

A small genus—two species only—of annuals (*ord.* *Cruciferae*). *Acaule*, the species generally cultivated, is a charming little plant only a few inches in height. Seeds should be sown out of doors in spring (April). As a rule, it is only necessary to sow once, seedlings from self-sown seed coming up each year afterwards in abundance. A rather shady situation is the most suitable, and almost any soil will do provided it be not very hot, dry, and sandy. The genus is now referred to *Cochlearia* by some botanists, but is kept distinct here for cultural purposes.

Principal Species :—

- acaule*, 2" to 3", sum., lil. (*Cochlearia acaulis* of some).

IONOPSIS.

Epiphytic Orchids (*ord.* *Orchidaceæ*), requiring a stove temperature. The plants are exceedingly pretty, and are favourites in many quarters, although one species only is generally met with—*paniculata*. The plants are rather difficult to do well, and pieces have to be continually imported, not only to increase but to keep up the stock. The plants do best if fixed to a block of wood, a little live sphagnum and fibrous peat being worked in between the roots, and hung up close to the glass. Plenty of water is required at all times to keep them healthy.

Principal Species :—

- | | |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <i>paniculata</i> , 6", wh., or
ro., flowers at various
seasons. | <i>tenera</i> (see <i>utricularioides</i>).
<i>utricularioides</i> , wh., pk.
spotted lip (syn. <i>tenera</i>). |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|

Involucraria (see *Trichomanes*).

Ione (see *Bulbophyllum*).

IOSTEPHANE.

Two species of hairy herbs (*ord.* *Compositæ*) from Mexico. Division of the roots in spring is an easy method of increase. Seeds, also sown in spring, soon germinate, and make good plants. Any ordinary garden soil will do. Although practically hardy, *heterophylla* should receive a little protection in severe winters. Long, damp, cold spells are injurious to it.

Principal Species :—

- heterophylla*, 1½', aut., hdy., lil.

IPOMŒA.

Description.—A large genus (*ord.* *Convolvulaceæ*) of plants of very varied habit. Some are hardy, others need a greenhouse or stove; some are annuals, others perennials; and herbs, shrubs, and climbers are all included. In most cases the flowers are large and showy, some very brilliant shades of blue being included. The limits of the genus have been considerably altered of late years, several plants being referred to it that were at one time placed in other genera. Thus the popular *Convolvulus major* is correctly *Ipomœa purpurea*; and *Mina lobata* is correctly *I. versicolor*. Of the economic products of the genus, *jalap*, from *Purga*, is the chief. The seeds of *hederacea* furnish a medicinal resin.

Propagation.—By seed for the annuals. All the stove evergreen perennials can be increased by cuttings of the side shoots, rooted in sand and peat in brisk bottom heat. *Horsfallia*, however, which is probably the best of the stove winter-flowering climbers, does best from layers, although cuttings may be rooted. *Versicolor*, or *Mina lobata*, as it is popularly called, does well if seed be sown out of doors, in a warm corner, at the beginning of April. It loves to ramble over old Pea sticks, or stumps of trees from which the branches have not been removed.

Soil.—Any fairly rich garden soil will do for the hardy and half-hardy species and varieties. For pot culture use fibrous loam, leaf soil, and old Mushroom bed manure, in equal parts, with sand.

Other Cultural Points.—The stove climbers need to be pruned when flowering is over. They should not be strained tightly to the roof, as the best effects are obtained when the flowering sprays are allowed to hang. *Purpurea* does only moderately well against a wall, as it is generally attacked by red spider. It likes a wooden trellis, or a circle of Pea sticks to clamber over, and then it keeps its foliage and flowers freely. It is a fairly good town plant.

Principal Species and Varieties :—

[NOTE.—All are perennials except where otherwise stated.]

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <i>Bona-Nox</i> , 10', Jy., Aug.,
st., cl., wh. | <i>Horsfallia</i> , win., st., ev.
cl., ro. |
| — <i>grandiflora</i> , large, fragrant. | — <i>Briggsii</i> . |
| <i>bonariensis</i> , sum., st., cl.,
pur., lil., roots tuberous. | <i>Learii</i> , Jy., Oct., st., ev.
cl., bl. (syn. <i>Pharbitis</i>
<i>Learii</i> of <i>Botanical</i>
<i>Magazine</i> 3928). |
| <i>hederacea</i> , 10', Jy., Sep.,
hlf-hdy. per., petals bl.
(syns. <i>Nil</i> and <i>Convolvulus Nil</i> of <i>Botanical Magazine</i> 188). Many garden vars.; <i>atroviolacea</i> (vio., wh.), <i>grandiflora</i> (bl.), and <i>Huberi variegata</i> (variegated foliage), are the best. | <i>pandurata</i> , Je., hdy. per.,
cl., wh., pur. throat. |
| | <i>Purga</i> , aut., st., ev. cl.,
pur., ro. (syn. <i>Exogonium</i>
<i>Purga</i> of <i>Botanical Register</i> xxxiii., 49). |
| | <i>Jalap</i> . |
| | <i>purpurea</i> , 10', Je., Sep.,
hdy. ann., dark pur. |

(*syns.* *Convolvulus purpurea* and *C. major*). Many garden vars.: *Burridgei* (crim.), *Dicksonii* (bl.), tricolor (red, wh., bl.), and *flore pleno* (double), are the best.

rubro-cerulea, Jy., Aug.,

Other Species and Varieties :—

acuminata, My., Sep., st., ev. cl., bl. (*syn.* *mutabilis*).

Aitoni, 10', Ap., Oct., st., cl., pale pur.

alatipes, Je., st., ev. cl., salmon pk.

albivenia, 10' to 15', Aug., Sep., st., ev. cl., wh., yel. throat, large (*syn.* *Gerrardii*).

angustifolia, Jy., st. ann., wh., or crim. yel. (*syn.* *filicaulis*).

Batatas, st., wh. (*syn.* *Batatas edulis*). Sweet Potato.

bignonioides, Jy., st., ev. cl., dark pur. (*syn.* *Batatas bignonioides*).

cathartica, 10', Aug., Sep., st., ev. cl., pur. (*syn.* *Pharbitis cathartica* of *Botanical Magazine* 4289); there is a ro. var.

chrysoides, Jy., Oct., st., small ev. cl., yel.

coccinea, 9' to 15', Je., Jy., hlf-hdy. ann., red, fragrant.

— *luteola*, or.

crassipes, 4', Aug., grh., pur.

dasysperma, Aug., st. ann., yel. (*syn.* *tuberculata* of *Botanical Register* 86).

st., cl., red (*syn.* *Hookeri*).

ternata, 3" across, st., cl., wh. (*syns.* *Horsfallia alba* and *H. thomsoniana*).

versicolor, Je., hdy. ann., ro., crim., yel. (*syn.* *Mina lobata*).

digitata, 10', Jy., Sep., st., ev. cl., vio. (*syn.* *platanensis*).

filicaulis (*see angustifolia*).

Gerrardii (*see albivenia*).

hederifolia, sum., aut., st., red, sc.

Jalapa, Aug., grh., red, wh., or pk. pur., root tuberous, 40 lb. to 50 lb. weight, sometimes called *Jalap* (*syn.* *Convolvulus Jalapa* of *Botanical Magazine* 1572).

muricata, 1', Je., Jy., st., red.

mutabilis (*see acuminata*).

Nationis, sum., grh. per., crim. pur. (*syn.* *Quamoclit Nationis* of *Botanical Magazine* 5432).

Nil (*see hederacea*).

platanensis (*see digitata*).

Quamoclit, 6', Jy., Sep., st. ann., cl., dark red

setosa, Aug., Oct., st., deciduous cl., pur., red.

sinuata, Je., Sep., grh., ev. cl., wh., red throat.

Tweediei, 6', Je., Jy., st., pur.

tyrianthina, 10', Aug., Nov., grh., deciduous cl., dark pur. (*syn.* *Pharbitis tyrianthina* of *Botanical Magazine* 4024).

a propagating frame, and then potted singly into 3" pots, which will last them until they are ready to be planted out.

Soil.—For the cuttings, equal parts of loam and leaf mould, with about one-fourth sand. A $\frac{1}{2}$ " layer of sand should also be placed on the surface of the soil. Less sand will be needed when potting off.

Principal Species and Varieties :—

Herbstii, 12" to 18", dark

maroon, under surface

crim., veins and stems

car., lvs. roundish heart

shaped (*syn.* *Amaranthus Verschaffeltii*).

— *acuminata*, narrower

lvs.

— *aureo-reticulata*, lvs.

grn. and gold, veins red.

— *Wallisii*, dwarf, lvs.

small, deep blk. pur.

Lindeni, lvs. narrow, deep

blood red.

— *formosa*, lvs. golden,

veined crim., grn., very

pretty.



Photo: Cassell & Company, Ltd.

IRIS GERMANICA (*see p.* 448) IN A POT.

IRIARTEA.

Stove Palms (*ord.* *Palmae*), rarely cultivated, and not easy to grow.

IRIS.

Description.—A large and important genus (*ord.* *Iridaceae*) of herbaceous plants chiefly hardy, with exceedingly bright and showy flowers. Geographically they have a very wide distribution, and their flowering seasons are so varied that Irises may be had in bloom at almost any time during the year. Most of them, however, blossom from April to June, when the innumerable garden varieties of *germanica*, *aphylla*, *squalens*, *pumila*, and *variegata* are in flower. In May and June,

Iridorchis (*see Cymbidium*).

Ipomeria (*see Gilia*).

Ipomopsis (*see Gilia*).

Ipsca (*see Pachystoma*).

IRESENE.

Description.—Handsome foliage plants (*ord.* *Amarantaceae*), of dwarf stature and bushy habit, in great request for bedding purposes. No matter what the season, they generally do well.

Propagation.—Iresines are rather tender, and a few degrees of frost are fatal to them. As a rule, therefore, they should be among the last of the bedding subjects to be placed outdoors, and it is wise to commence propagation quite by the end of August, so as to get it over by the time frosts are to be expected. Cuttings root readily at almost any time of the year if kept close in an ordinary frame, but the emission of roots may be hastened if the cuttings are consigned to a hotbed. The autumn struck cuttings need not be moved out of their cutting pots, but should be given a place on a shelf near the glass in a warm house for the winter months. They should also be watered rather sparingly. More water may be given as growth begins with the New Year, and regular syringing is helpful. Plenty of material for cuttings will soon be produced, and these should be taken off as fast as a small batch can be had, struck in

also, the handsome bulbous English and Spanish Irises are in flower, and in June and July the varieties of the sub-aquatic *lævigata* are expanding their huge blooms, which are the largest and finest of all the Irises. Iris flowers, although

Irises, as they are variously termed. Superb garden flowers are to be found in both sections. *Germanica* makes a splendid town plant. *Pumila* and its varieties make capital edging plants, and with all the dwarfer-growing species may be accommodated



Photo: Cassel & Company, Ltd.

IRIS LÆVIGATA VAR. (syn. KÄMPFERI, see p. 448).

showy, are very fugitive. They last fairly well when cut, but should be taken in the bud stage. They will expand as well in water as they would upon the plants. Naturally the genus divides itself into two sections, viz. the rhizomatous section, or Irises proper, in which the *susiana* group (Cushion Irises) is a sort of sub-genus, and bulbous Irises, Xiphions, or English and Spanish

upon the rockery. The tall-growing *sibirica* makes an excellent bed if planted by itself. It is best treated as a sub-aquatic. Indeed, so varied are the characters of the plants that an Iris garden is a most interesting adjunct to the flower garden. The economic products of the genus are not great; they are represented by *Orris Root*, the root of the *Florentine Iris*, which is largely used by perfumers.

Propagation.—By division of the rhizomes where they are present. In the case of *germanica* and its varieties the rhizomes may be cut up at almost any time, for they are exceedingly tenacious of life; few plants more so. For the others, spring is the best time. Use a knife, or a sharp spade, and make the cuts clean, with as little bruising as possible. The *Xiphions* may be raised from seeds,

nutriment. For such Irises as *reticulata* and its varieties, which are often grown in pots, a mixture of loam and leaf soil in equal parts, with one-sixth of the whole road scrapings, will answer well.

Other Cultural Points.—*Ungicularis (stylosa)* and its varieties should be planted in a sheltered position. Although they flower early (December), even a few degrees of frost are fatal to the flowers,



Photo: Cassell & Company, Ltd.

IRIS SUSIANA (see p. 449).

and by offsets from the older bulbs. In removing these offsets great care must be taken not to bruise the old bulbs, for they resent rough usage by dying off. Seed should be sown (of any of the species in either section) in light, sandy soil as soon as it is ripe, and the seed pans should be consigned to a cold frame.

Soil.—Almost any garden soil will suit, but it is improved by the addition of a few medium-sized lumps of sandstone. Mulchings of manure help to keep the roots cool, and furnish the necessary

which are very tender. The *Xiphions* make elegant bedding plants. They may be either mixed with other bulbs or planted by themselves. The latter is preferable, as the plants do not like to be disturbed. Six inches between the bulbs is a good distance, and the crowns should be at least 2" below the surface of the soil. The soil must be well drained, and the position sheltered from cold winds. Given this, they will come up year after year in increasing numbers, and with undiminished beauty. *Lævigata* (Kämpferi) is only just begin-

ning to be known to the general public. During the past few years numbers of superb varieties have been introduced from Japan, and so far they seem to do remarkably well. They are all best treated as sub-aquatics—planted by the sides of streams or ponds in shallow water. They may also be grown in ordinary soil, but need abundant supplies of water in spring, summer, and autumn; less in winter. The subjoined lists of species and



Photo: Cassell & Company, Ltd.

IRIS IHERICA.

varieties are not exhaustive. The best of the species have been given, with a few of the best varieties. There are many others, but space will not permit of their mention here.

THE CUSHION IRISES.

This is the popular name given to the Oncocylus and Regelia sections of Irises. They are much more tender than the other Irises, and must be planted in warm, sunny, and sheltered spots, in a light but rich soil. Some successful growers put

their plants in cold skeleton frames, which are covered during the early autumn and winter to keep off heavy rains, while admitting plenty of air at the sides. Planting should be done in December, not earlier, or growth will be precocious, and pay the penalty in being cut down by frost. A capital plan, where the plants are in the open ground, is to cover them with Heather or Reeds until March, when the covering may be removed. The plants do not need frequent disturbance, and may remain in the same position for years. A good ripening by exposure to the sun after flowering is necessary. When the bulbs have to be lifted, from four to six weeks after flowering is over is a good time. They should then be stored in sand on a shelf in a cool, dry room until December. The soil will be much improved by a dressing of bone meal, at the rate of from 3 oz. to 5 oz. per square yard.

IRISES PROPER:—

The presence of a rhizome, or creeping root stem, is noticeable: s. = standards; f. = falls.

Principal Species and Varieties:—

- | | |
|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| aphylla, 1', My., lil., beard wh. | 446); many vars. Japanese Iris. |
| aurea, 3' to 4', Je., yel. | neglecta, 1½' to 2', Je., lil., beard yel.; many vars. |
| biflora, Ap., vio. pur., beard yel. (syns. fragrans, nudicaulis of Botanical Magazine 5806, and subbiflora). | orientalis, 3', Je., yel., wh. (syn. ochroleuca). |
| cretensis, Ap., My., lil. | Pseudacorus, 3', My., yel.; there is a variegated form. Water Flag. |
| cristata, 6", Ap., My., s. lil., f. with yel. crest, hlf-hdy. (syn. japonica). | pumila, 4" to 8", Ap., lil., pur., wh. beard; many vars. Good for rockeries and edgings. |
| flavescens, 2' to 3', My., yel. | sibirica, 1' to 4', My., Je., bl., small; many vars. |
| florentina, 2' to 3', My., wh., flowers and roots fragrant; albicans is a pretty var. Orris Root. | acuta, 1½', bl. (also wh. form), alba, 3', wh. |
| fetidissima, 2' to 3', Je., bl., lil., small, seeds or.; British. Stinking Gladwin. | atropurpurea, 3', pur., and orientalis, bl.; good. |
| germanica, 2' to 3', My., Je., pur., beard yel.; many vars. (see pp. 445 and 449). German Iris. | squalens, 2' to 3', My., Je., lil., pur., beard yel., Elder scented; many vars. |
| graminea, 9", My., lil., pur., fragrant. | unguicularis, 1½' to 2', Dec., Feb., lil., bl. (syn. stylosa, see p. 450); several vars., including wh. |
| hybrida, 2' to 3', Je., flowers various, of garden origin. | variegata, 1' to 1½', My., claret br., beard yel.; several vars.; alba is good. |
| lævigata, 1½' to 2', Je., Jy., Aug., flowers various, a sub-aquatic (syn. Kämpferi, see p. | versicolor, 1' to 2', Je., claret pur. |

CUSHION IRISES:—

- | | |
|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| bismarckiana, 9", st., bl., veined pur., flowers yel., veined red pur. (syn. Sari nazarena). | Lortetii, 1', My., creamy wh., marked ro. |
| Gatesii, 2½", hdy., Je., creamy wh., spotted silver grey. | lupina, 6", gm., yel., veined red, heavily bearded; var. Schachach is vigorous, yel., br., pur. Wolf's Fur Iris. |
| iberica, 3" to 9", My., s. pale lil., wh., f. pur., br., with pur. blotch (see figure); insignis is a pretty var. | nigricans, s. pur., blk., maroon, flowers crim., blk., with a bl. cushion. |
| Korolkowii, 1', My., Je., wh., veined with reddish br. | paradoxa, s. wh., veined bl., flowers with a crim. beard; Choschab is a robust var., 8", wh., netted, vio. |

susiana, 1' to 1½', Ap.
My., br., blk., spotted
lil., distinct and showy
(see p. 447).
tubergeniana, 8", metal-

Other Species and Varieties:

arenaria, 3" to 4", My.,
yel., striped pur., br.
Minor is a dwarf var.
balkana, 1', Ap., lil., pur.
Chamaeiris, 4" to 6", My.,
yel. Olbiensis is a pur.,
wh., and yel. var., and
italica is pur. and
dwarf.
douglasiana, 6" to 12",
Je., lil., pur. Pygmæa
is a dwarf var.
ensata, 1', Je., Jy., lil.,
pur. (syns. pabularia,
fragrans, and longi-
spatha).
fulva, 2' to 3', Je., br.
guldenstaediana, 2', Je.,

lie grn., bl., very pretty
and distinct.
urmiensis, 8", st., flowers
broad, primrose yel.,
beard yel., fragrant.
willmottiana.

wh., or. beard: wh.,
bl., and yel. vars. (syns.
eriatrica and wittmann-
iana of gardens).
hexagona, 3' to 4', Ap., lil.
japonica (see cristata).
Korolkowii, 1' to 1½', wh.,
br.; several vars.
longipetala, 2' to 3', sum.,
lil., keeled yel.
robinsoniana (see Morea
robinsoniana).
Tectorum, 1', Je., lil. (syn.
tomilophia).
tuberosa, Ap., My., pur.,
yel.
virescens, Ap., My., grn.,
yel.

Bearded Flag Irises: A Selection of Varieties:—

germanica.

alba, wh.
Kharput, bl., vio., pur.
Purple King, pur.

umana.

Calypso, wh., veined bl.
Duc de Nemours, pur.,
edged wh.
Mrs. H. Darwin, wh.,
veined vio.

pallida.

Celeste, bl.
Garibaldi, ro., lil.
Madame Pacquette, claret
red.

variegata:—

Chénédolé, s. yel., f. wh.
Darius, s. yel., f. lil.

variegata group:—

Jokai, crim.
Kumagai, wh.
Nagato, lil., bl.

Beardless Irises:—

aurea lauchiana, golden
yel.
Hartwegi, 1', My., yel.
Monspur, bl., spotted yel.

aphylla.

Bridesmaid, lavender.
Gazelle, wh., lil., bl.
Madame Chereau, wh., bl.

neglecta.

Cordelia, s. lil., f. dark
crim.
Fairy Queen, lavender,
veined vio.
Hannibal, s. lavender, f.
pur.

squalens.

Harrison Weir, s. bronze
br., f. crim.
Lord Grey, fawn, flushed
ro.
Mozart, bronze yel.,
veined wh.

Sans Souci, yel., veined
br.

Tomoye, wh., bl., gold.
Tanga, deep bl.
Yamagata, wh., veined
vio.

hybrid (Monnieri ×
spuria).
Monnieri, golden yel.
spuria A. W. Tait, bl.
— Notha, pur., lil.

XIPHIONS.

NOTE.—The bulbous rootstock is the distinguish-
ing feature here. In all cases the leaves are
narrow, often drooping, and very elegant. s. =
standards; f. = falls.

Principal Species and Varieties:—

alata, Oct., Dec., s. lil.,
pur., f. lil., pur., spotted
yel.; many vars.
bakeriana, 6", Jan. and
Feb., st., wh., vio.,
flowers bl., fragrant,
earlier than reticulata.
filifolia, 1' to 2'. s. deep
pur., f. pur., yel. spotted
(syn. Xiphion tingita-

num of Botanical Maga-
zine 5981).
Histrio, 1', Feb., s. lil.,
streaked on paler
ground.
orchioideis, 9", Ap., yel.
persica, 3" to 4", Feb.,
Mch., flowers pale yel.,
lil., grn.
— Heldreichii, 4", soft

lavender, flowers vio.,
veined wh., crest yel.,
4" across, should be
grown in frames in pots
or pans (syn. sten-
ophylla).

reticulata, 6" to 9", Feb.,
Mch., vio., pur., f. yel.
lined, Violet scented.
Good for pots, but must
not be forced hard.
Many vars., of which
Krelagei, more slaty
pur. and not scented, is

one of the best. His-
trioides and major are
also excellent.
tingitana, 2' to 3', lil.,
pur.

Xiphioideis, 1' to 2'. lil.,
pur., Jy. (syns. anglica
of gardens and Xiphion
latifolium). English
Iris.

Xiphium, 1' to 2', Je.,
flowers various; many
vars. Spanish Iris.

Other Species:—

Boissieri, My., bluish
pur., reddish pur.
caucasica, Feb., Mch., yel.
Danfordiae, Feb., Mch.,
s. yel., f. spotted br.
fosteriana, Mch., s. pur.,
f. yel.
juncea, 1' to 1½', My., Je.,
yel. Bulbs eaten in
Algeria.
rosenbachiana, Mch., yel.,
or., pur., fragrant
two vars.

sindjarensis, Mch., dull lil.
Sisyrinchium, 6" to 12",
Ap., My., lil., f. spotted
yel. (syns. Morea Sisy-
rinchium of Botanical
Magazine 1407 and
Xiphion Sisyrinchium
of Botanical Magazine
6096).

Vartani, Oct., Dec., lil.,
yel. crest.



GERMAN IRISES AS CUT FLOWERS.

A Selection of Spanish Irises :—

[NOTE.—These flower from ten days to a fortnight before the English varieties.]

Avalanche, wh., spotted yel.	Golden King, yel.
California, rich yel., or spots.	Snowball, wh., spotted yel.
Catharina, deep bl., wh., or.	Thunderbolt, bronze pur., br., or. blotches. The height is from 1' to 2½', according to the var. and cultivation.

A Selection of English Irises :—

Clara Butt, 2', china wh.	Rosa Bonheur, 20'', wh., flaked crim., vio.
Emperor, 2', grey, spotted bl.	Vainqueur, 2', st., deep lavender, feathered vio., flowers light lavender, spotted vio.
Lord Palmerston, 20'', blk., crim., pur.	
Mont Blanc, 2', wh.	

ISATIS.

Hardy annual or biennial herbs (*ord.* Cruciferae) of little garden value, but interesting because of the dye furnished by one species, tinctoria. This was the Woad of the ancient Britons, and has been cultivated for many years for the sake of its dye.

Principal Species :—

glauca, 3', Jy., Aug., yel., a good border flower.

ISERTIA.

Tropical American trees and shrubs (*ord.* Rubiaceae), rarely cultivated, but possessed of handsome flowers. Cuttings of the side shoots may be struck in sandy soil in bottom heat, at any time in spring or summer. Soil, loam and peat in equal parts, with sand.

Only Cultivated Species :—

coccinea, 8' to 12', Jy., st., sc.; a handsome shr.

ISMENE (*see* HYMENOCALLIS).**ISOCHILUS.**

Epiphytic stove Orchids (*ord.* Orchidaceae). The flowers are showy, rose or red in hue, and remarkable for the curiously twisted lip, but the plants are rarely grown.

ISOLEPIS.

Although this genus (*ord.* Cyperaceae) is now referred to *Scirpus*, the name *Isolepis* is well known, and still kept up in gardens, and likely to be for some years. The genus is chiefly represented by *gracilis*, which is in such constant demand for decorative purposes. This species is really almost

sub-aquatic in its tendencies, and will do well anywhere as long as it gets plenty of water. Soil is a secondary consideration, although two parts of good loam, one part of leaf mould, and one-sixth of sand produce the best results.

To work up a stock quickly, old clumps should be divided up into small portions, each division being potted into a small pot in sandy soil, and started



Photo: Cassell & Company, Ltd.

IRIS UNGUICULARIS (*syn.* *STYLOSA*, *see* p. 448).

into growth in a warm propagating frame. New growth is soon made. It makes little difference whether the old growths be cut away or not, for young ones soon start. Old plants need to be occasionally cut over, or they become rather untidy.

Whilst *Isolepises* are commonly regarded as greenhouse plants, they will do well out of doors during the summer months, and, on the other hand, they may be employed for edging the stages in warm houses if no better subject offers. They make good room plants.

Principal Species :—

gracilis, 6'', grh. grm. (correctly *Scirpus nodosus*).

- Irish Heath* (*see* *Daboecia*).
- Irish Ivy* (*see* *Hedera Helix canariensis*).
- Iron Bark* (*see* *Eucalyptus*).
- Iron Shrub* (*see* *Sauvagesia erecta*).
- Iron Tree* (*see* *Parrotia persica*).
- Iron Weed* (*see* *Veronica*).
- Iron Wood* (*of Australasia, see* *Metrosideros*).
- Iron Wood* (*of North America, see* *Bumelia lycioides*, *Carpinus americana*, and *Ostrya virginica*).
- Iron Wood* (*of the United States, see* *Cyrilla racemiflora*).
- Ironwort* (*see* *Siderites*).
- Iroucana* (*see* *Casearia*).
- Isabella Grape* (*see* *Vitis Labrusco*).
- Ischarum* (*see* *Bianum*).
- Ischnia* (*see* *Tamonea*).
- Isehyrolepis* (*see* *Restio*).
- Iseurochloa* (*see* *Bambusa*).
- Ismelia* (*see* *Chrysanthemum*).

ISOLOMA.

A large genus of stove herbs (*ord.* Gesneraceæ) for the most part with showy flowers. Few of the species are cultivated, however, and there is much confusion in gardens between them and the Achimenes and Gesneras. Cuttings of the tips of the young shoots root readily enough if dibbled into sandy soil and kept in a close, warm frame with bottom heat for a couple of weeks. Afterwards they may be potted on, first into 3", then into 4½" pots, which are large enough for flowering. Soil, equal parts of fibrous loam and leaf soil, with one-sixth of sharp sand.

Principal Species :—

hondense, various, *yel.*, about 1" long (*syn.* Gesnera *hondensis* of *Botanical Magazine* 4217). Plants may be had in flower all through the year.

Other Species :—

deppeanum, 2' to 3', *sum.*, *or.*, red (*syn.* Gesnera *elongata* var. of *Botanical Magazine* 3725).
digitaliflorum, *ro.*, *pur.*, *wh.* throat.
elegans, *pur.*, *yel.* (*syn.* Moussonia *elegans* and *formosa*).
hypocytiflorum, *or.*, red (*syn.* Gloxinia *hypocytiflora* of *Botanical Magazine* 5655).
Lindeni, *wh.*, throat banded *vio.*
molle, *win.*, red (*syn.* Gesnera *mollis* of *Botanical Magazine* 3815).
ocellatum, *win.*, red (*syn.* Achimenes *ocellata* of *Botanical Magazine* 4359).
pictum, 3', *sum.*, *aut.*, *sc.*, *yel.* (*syn.* Gesnera *picta* of *Botanical Magazine* 4431).
schiedeianum, 1½', *Nov.*, *sc.* (*syn.* Gesnera *schiedeana* of *Botanical Magazine* 4152).
Seemannii, 2', *Oct.*, red (*syn.* Gesnera *Seemannii* of *Botanical Magazine* 4504).
triflorum, 1½' to 2', *sum.*, *yel.* (*syn.* Gesnera *triflora* of *Botanical Magazine* 4342).

ISOMERIS.

Only one species, arborea (*ord.* Capparidæ), and it is of no garden value, being only grown as a curiosity.

ISOPLEXIS (syn. CALLIANASSA).

Two species of pretty greenhouse evergreen shrubs (*ord.* Scrophularinææ). Increase is by cuttings of the semi-matured shoots in summer, dibbled into sand under a bell-glass. Soil, loam and leaf mould in equal parts, with sand.

Only Species :—

canariensis, 4' to 6', *Je.*, *sc.* (*syn.* Digitalis *canariensis*).
sceptrum, 3' to 4', *Jy.*, *yel.* (*syn.* Digitalis *sceptrum*).

ISOPOGON.

Greenhouse evergreen shrubs (*ord.* Proteaceæ) very seldom seen in cultivation.

ISOPYRUM.

Dwarf perennial herbs (*ord.* Ranunculaceæ) of slender, elegant habit. The most important species is thalictroides, whose foliage looks not unlike a Maidenhair Fern. Clumps of it are very effective in nooks of the rockery, or the herbaceous border. Increase is by seeds, sown when ripe, or by root division in the autumn. Any ordinarily good soil will do.

Principal Species :—

thalictroides, 9", *spr.*, *wh.*, small, root creeping.

Isoloma (of J. Smith, see *Lindsaya*).

Isolophus (see *Polygala*).

Isonandra Gutta (see *Dichopsis*).

ISOTOMA.

Obscure little stove and greenhouse herbaceous perennials (*ord.* Campanulaceæ) seldom or never seen in gardens.

ISOTROPIS.

Greenhouse evergreen shrubs (*ord.* Leguminosæ), propagated by cuttings of the young wood in sandy peat beneath a bell-glass. Soil, one part fibrous loam, three parts fibrous peat, with pieces of charcoal and coarse sand.

Principal Species :—

striata, 1', *sum.*, *or.* (*syn.* Chorizema *spartioides*).

ITEA.

Hardy deciduous and evergreen shrubs (*ord.* Saxifragææ). Propagated by seeds sown in spring, or by suckers. Soil, peat and sand. A moist position is best.

Principal Species :—

Cyrilla (see *Cyrilla racemiflora*).
spinosa (see *Bursaria spinosa*).
virginica, 6', *Jy.*, *wh.*

IVY (see HEDERA).**IXANTHUS.**

Herbaceous biennials (*ord.* Gentianææ), requiring greenhouse culture. Propagation, from seeds sown in spring. Soil, any fertile mixture of peat and sand.

Only Species :—

viscosus, 2', *Je.*, *wh.*, *yel.* (*syn.* *Exacum viscosum*).

IXIA.

Description.—Half-hardy Cape bulbs (*ord.* Iridææ) that produce long spikes of very beautiful flowers, and bear marked resemblances to Babianas, Sparaxises, and Tritonias.

Propagation.—By seeds, which are best sown in shallow pans of sandy peat in spring. Also by offsets, of which considerable numbers are produced; these quickly form flowering plants.

Soil.—Three parts mellow loam, one part leaf mould, and coarse sand.

Other Cultural Points.—Though Ixias are not strictly hardy, they will be found to succeed admirably on a warm border which is well drained. The soil should be somewhat light in character, and the bulbs must be planted deeply and covered with some material in the winter that will throw off heavy rains. Whether grown in pots or out of doors it is essential that the foliage ripen off naturally, so as to plump up the bulbs for the following season's flowering. If it is necessary to remove them from the soil immediately after flowering, lay them out in some convenient place where the leafage will die slowly, and not where it will be almost instantly dried up. The best time

Isotypus (see *Onoseris*).

Italian Oak (see *Quercus Esulus*).

Iturbide's Spear (see *Triticale laxa*).

Ivesia unguiculata (see *Potentilla unguiculata*).

Ivira (see *Sterculia*).

Ivory Nut Palm (see *Phytelephas macrocarpa*).

Ivy-leaved Fern (see *Hemionitis*).

Ivy-leaved Pelargonium (see *Pelargonium peltatum*).

Ivy-leaved Toadflax (see *Linaria Cymbalaria*).

Izauchenus (see *Lagenophora*).

for potting is October, and the same treatment as that accorded to Freesias and other Cape bulbs will suit.

Principal Species :—

[NOTE.—Many species that were at one time placed under *Ixia* have now been transferred to *Sparaxis*, *Tritonia*, *Micrantha*, *Romulea*, and *Hesperanthera*, which *see*. Those here named are regarded by the Kew authorities as true *Ixias*.]

<i>crateroides</i> (<i>see speciosa</i>).	<i>Gladiolus longiflorus</i> ,
<i>flexuosa</i> , 1½', Ap., pk.	and <i>Tritonia longiflora</i>).
<i>fusco-citrina</i> (<i>see maculata</i>).	<i>patens</i> , 1', Ap., pur.
<i>maculata</i> , 1', My., br., wh. (<i>syns. fusco-citrina</i> and <i>spicata</i>).	<i>polystachya</i> (of <i>Linnaeus</i> , not <i>Jacquin</i>), 1½', sum., wh., br. (<i>syn. erecta</i>).
<i>monadelphica</i> , 9", My., bl.	<i>speciosa</i> , 1', Jy., pur., crim. (<i>syn. crateroides</i>).
<i>piciculata</i> , 1', sum., yel., wh. (<i>syns. longiflora</i> ,	<i>spicata</i> (<i>see maculata</i>).
	<i>viridiflora</i> , 1½', My., grn.

IXIOLIRION.

Syrian bulbous-rooted plants (*ord. Amaryllidæ*) which, though introduced in 1844, have not become very common. They are perfectly hardy, and produce such charming flowers that they are worthy of inclusion in every garden. Propagation, by offsets from the bulbs, or by seeds when procurable. In neither case is special soil necessary. *Ixiolirions* flourish in any fertile mould, but, like many bulbous plants, delight in sound loam, leaf mould, and sand.

Principal Species :—

montanum, 1', Jc., bl. (*syns. Amaryllis* and *Alströméria montana*); *macranthum* is a good var.

Other Species :—

kolpakowskianum, 1', *Pallasii*, 1', sum., bl. sum., bl. or wh.

IXODIA.

Greenhouse evergreen shrubs (*ord. Compositæ*). Propagation, by cuttings of firm young shoots in late spring beneath a bell-glass. A mixture of fibrous loam and peat suits.

Principal Species :—

achilleoides, 2', sum., wh.

IXORA.

Description.—Valuable stove plants (*ord. Rubiacæ*) which, when well grown, are difficult to surpass for beauty of flower and foliage. To those who grow specimen plants for exhibition they are indispensable.

Propagation.—By cuttings of short-jointed shoots, moderately firm, in sandy peat over bottom heat. If the cuttings can be inserted singly, and the pots are plunged in a gentle hotbed, rooting is more certain and slightly quicker. When well rooted pinch out the tops, and a few days later place in larger pots.

Soil.—Two parts good fibrous loam, one part leaf mould, and one part fibrous peat, with a generous addition of silver sand.

Other Cultural Points.—As the roots are very susceptible to damage from soil sourness, the drainage must be perfect. After the first potting, the plants are best on an ash or shell covered stage, water being given freely as the soil becomes permeated with roots. Syringing will be found beneficial, and shade from bright sunshine is advisable. Young plants in 6" pots will flower, and may be afterwards encouraged to take a few weeks' rest prior to being judiciously pruned early

in the year. *Macrothyrsa*, however, must not be pinched. A temperature of 75° is suitable for starting. As soon as growth has commenced, any renovation of the roots or repotting should be attended to. Until the plants have done flowering they must be accorded a high temperature and a moist atmosphere. When the pots are full of roots and the flower buds are developing, liquid manure may be applied frequently. Careful pruning and pinching will be found to obviate the necessity for an elaborate course of training.

Enemies.—*Ixoras* are liable to the attacks of thrips and mealy bug. Vaporisation has been found to answer well, but sponging the leaves must be had recourse to in severe cases, as the beauty of the plants is very quickly lost. Frequent and forcible syringings are good preventives, and care should be exercised that neither pest obtains a firm hold.

Principal Species, Hybrids, and Varieties :—

<i>coccinea</i> , 4', sum., or., sc. There are several splendid garden forms, seedlings from this species, and varying slightly in habit and colour, notably <i>dixiana</i> , <i>Fraseri</i> , <i>grandiflora</i> , <i>luteus</i> , <i>Morsei</i> , and <i>superba</i> .	<i>javanica</i> , 3', Je., or.
<i>Duffii</i> (<i>see macrothyrsa</i>).	<i>macrothyrsa</i> , 6', sum., ver., sc. (<i>syn. Duffii</i> , <i>see p. 453</i>).
<i>Griffithii</i> , 4', Jy., red, yel.	<i>Pilgrimi</i> , 4', Jy., or., sc., crim., hybrid (<i>coccinea</i> × <i>Williamsii</i>).
<i>incarnata</i> , 3', Je., pur., probably a form of <i>coccinea</i> .	<i>Prince of Orange</i> , 3', Jy., bright or.
	<i>Westii</i> , 3', Aug., rosy pk., blush, hybrid.
	<i>Williamsii</i> , 4', Jy., salmon red, very fine.

Other Species and Varieties :—

<i>alba</i> (<i>see stricta</i> var.).	<i>grandiflora</i> (<i>see coccinea</i> var.).
<i>barbata</i> , 10', Jy., wh.	<i>jucunda</i> , 10', My., wh.
<i>crocata</i> (<i>see stricta</i> var.).	<i>laxiflora</i> , 4', Je., wh., pk.
<i>dixiana</i> (<i>see coccinea</i> var.).	<i>Morsei</i> (<i>see coccinea</i> var.).
<i>Fraseri</i> (<i>see coccinea</i> var.).	<i>salicifolia</i> (<i>see fulgens</i> var.).
<i>fulgens</i> , 5', Aug., or.; <i>salicifolia</i> and the variegated form are varieties of this.	<i>stricta</i> , 3', Jy., sc.; <i>alba</i> and <i>crocata</i> are forms.

JABOROSA.

Herbaceous perennials (*ord. Solanacæ*). Propagation, by division of the root-stock in spring; or by cuttings under hand-lights. Soil, well-drained sandy loam.

Principal Species :—

integrifolia, 1', Jy., Sep., wh.

JACARANDA.

Stove evergreen trees (*ord. Bignoniaceæ*). Propagation, by cuttings of half-ripened wood in very sandy soil beneath a bell-glass over bottom heat. Soil, equal parts of fibrous peat and loam, with coarse sand. The drainage must be perfect.

Principal Species :—

<i>cærulea</i> , 10', sum., bl.	<i>ovalifolia</i> , 12', My., bl.
<i>filiatifolia</i> , 20', sum., bl.	(<i>syn. mimosaefolia</i>).

JACKSONIA.

Greenhouse evergreen shrubs (*ord. Leguminosæ*). Propagation, by cuttings in spring in sandy soil beneath a bell-glass. Soil, equal parts of peat and loam, with coarse sand.

Jaca (*see Artocarpus*).

Jacinth (*see Hyacinth*).

Principal Species :

scoparia, 12', Je., nearly lily., yel. (*syn.* *Viminaria lateriflora*).

JACOBINIA.

Stove perennials (*ord.* *Acanthaceæ*) of shrubby habit, closely allied to *Justicia*. Natives of South America. Propagation, by cuttings, in sandy soil,

Principal Species and Varieties :—

chrysocephana, 3', win., yel. (*syn.* *Cyrtanthera chrysocephana*).
ghiesbreghtiana, 2', Dec., sc. (*syns.* *Justicia* and *Sericographis ghiesbreghtiana*).

magnifica, 1' to 15', Aug., ro.
 — *carnea*, 3' to 9', sum., pale ro. (*syn.* *Justicia carnea*).
 — *pohliana*, 3' to 9', aut., red.



IXORA MACROTHYRSA (*syn.* *DUFFII*, see p. 452).

in a close pit. Soil, good loam, peat or leaf soil, a little dried cow manure, and sand. Excess of moisture at the roots must be avoided in the case of young plants. Pinch out growing points to secure shapely plants. Keep close to the glass so as to prevent spindly shoots.

Jackanapes-on-Horseback (*see Polyanthus*).

Jack-in-a-box (*see Hernandia*).

Jack-in-the-Green (*see Polyanthus*).

Jack Tree (*see Artocarpus incisa*).

Other Species :—

aurea, 6', Jy., yel. (*syn.* *Cyrtanthera catalpifolia*).
coccinea, 5', Feb., sc. (*syn.* *Justicia coccinea*).

Lindeni, 2½', spr., or. yel.
pauciflora, 3', spr., sc., yel. (*syn.* *Libonia pauciflora*).
penrhosiensis (*see Libonia*).

Jacobaea (*see Senecio*).

Jacobea Lily (*see Sprekelia formosissima*).

Jacob's Ladder (*see Polemonium caruleum*).

Jacob's Staff (*see Verbascum Thapsus*).

JACQUEMONTIA.

Evergreen twiners (*ord.* Convolvulaceæ), requiring intermediate or stove treatment. Propagation, by cuttings of the side shoots in late spring in sandy soil beneath a bell-glass over gentle bottom heat. Soil, loam and peat in equal parts with sand.

Principal Species :—

violacea, 6', Aug., bl. — canescens, 6', Aug., bl.

JACQUINIA.

Stove evergreen shrubs (*ord.* Myrsinæ). Propagation, by cuttings of ripe wood in sandy peat beneath a bell-glass over bottom heat. Soil, three parts peat and one part fibrous loam, with coarse sand.

Principal Species :—

armillaris, 6', Je., wh. aurantiaca, 5', Je., or.
ruscifolia, 4', sum., wh.

JAMESIA.

A hardy shrub (*ord.* Saxifragæ) whose beauty warrants its culture in all gardens. Propagation, by seeds or layers. Any fertile soil.

Only Species :—

americana, 4' to 8', spr., wh. (*see figure*).

JAMESONIA.

A small genus of greenhouse Ferns (*ord.* Filices), of no particular value.

JAPANESE DWARFED TREES.

From the earliest times both Japanese and Chinese gardeners have excelled in the curious art of dwarfing trees, so that in their miniature landscapes they might have exact replicas in all but stature of their native forest trees. The whole art of dwarfing trees lies in checking the sap flow and removing all strong growths. The former is secured by reducing the number of roots at an early stage of the tree's life, by keeping the roots in narrow and shallow pots (usually of artistic design), and by preventing the roots from wandering over or through the pots in search of food. Water is sparingly afforded, and additional root room seldom provided. Besides the simple process of dwarfing, there is that of training, which is usually conducted in such a manner as to materially check growth. Sometimes only the tips of the roots are kept in the soil and the plant appears to be standing on stilts, and in addition to this its head may be trained round and among the leading root branches, and

even brought down to a lower level than the pot in which it grows. For the various styles of training dwarfed trees the Japanese gardeners have distinctive names, and this is necessary when it is remembered that more than one generation of gardeners may manipulate some of the trees ere the full development of some particular style is reached.

The trees selected for dwarfing are chiefly *Cupressus obtusa nana*, the Chabu Hiba of the Japanese; *Larix leptolepis*, the Japanese Larch; *Pinus densiflora*, *Nandina domestica*, *Podocarpus macrophyllus*, Plums, Cherries, Japanese Maples, and, in a lesser degree, *Cycas revoluta* and some Bamboos.

During recent years large importations of Japanese dwarfed trees have been made into this



JAMESIA AMERICANA.

country by private individuals, by British nurserymen, and also by enterprising Japanese growers. The plants have found a ready sale among lovers of the curious and interesting, but the cult is not likely to become generally popular. At present there is one nursery in England, near London, devoted to Japanese dwarfed trees, and conducted by an experienced Japanese.

JASMINUM.

Description.—A large and widely distributed genus of plants (*ord.* Oleaceæ) that includes hardy deciduous, hardy evergreen, greenhouse, and stove subjects. The majority are climbers, producing either white or yellow flowers, frequently very

Jacquanga (*see Costus*).
Jalapa (*see Mirabilis*).
Jalap Plant (*see Ipomoea Purga*).
Jaltomata (*see Saracha*).
Jamaica Dogwood (*see Piscidia*).
Jamaica Ebony (*see Brya Ebenus*).
Jamaica Honeysuckle (*see Passiflora laurifolia*).
Jamaica Horse Bean (*see Canavalia ensiformis*).
Jamaica Paroquet Bur (*see Triumfetta*).
Jamaica Pepper (*see Pimenta vulgaris*).
Jamaica Plum (*see Spondias lutea*).
Jamaica Rose (*see Meriania*).
Jambolifera (*see Acronychia*).
Jambosa (*see Eugenia*).
Jamesia of Nees (*see Stephanomeria*).
Janipha (*see Manihot*).
Jankaea (*see Ramondia*).
Janthe (*see Celsia*).
Japan Cedar (*see Cryptomeria*).

Japan Lacquer Tree (*see Rhus vernicifera*).
Japan Medlar (*see Photinia japonica*).
Japan Wax (*see Rhus succedanea*).
Japanese Oak (*see Quercus glabra*).
Japanese Pagoda Tree (*see Sophora japonica*).
Japanese Toad Lily (*see Tricyrtis hirta*).
Japanese Yew (*see Cephalotaxus*).

fragrant. The common Jasmine or Jessamine is one of the best loved of garden plants, and the yellow winter-flowering nudiflorum is almost as great a favourite.

Propagation.—The hardy species by suckers, by layers pegged down at any season, or by cuttings in sandy soil under a hand-light. Stove or greenhouse species by cuttings of young, firm growth, taken off with a small heel of old wood attached, and placed in sandy peat in a close case or under a bell-glass in a warm pit.

Soil.—Any fertile garden soil, well drained, suffices for the hardy sorts, but those needing warmth and protection succeed best in a mixture of peat, loam, and sand.

Other Cultural Points.—Prim, close training is objectionable in most plants, but particularly so with Jasmines. If allowed free growth the hardy climbing species are charming for covering porches, arbours, pergolas, high fences, and verandah pillars. Nudiflorum is splendid for pillars and house fronts. Pruning must take the form of thinning out useless growth. Sambac and its double form, as well as gracillimum, need plenty of heat, and the latter will stand rather close pruning after flowering.

Insect Enemies.—The stove species are special favourites with mealy bug, but if preventive measures are taken the plants can easily be kept clean.

Principal Species and Varieties :—

gracillimum, 4', win., st., wh.	wh. (<i>syn.</i> ochroleucum). Common Jasmine.
grandiflorum, 15', Je. to Oct., grh., wh.	— affine, larger than the type.
humile, 3', Jy., hdy., yel. : revolutum is probably a strong-growing form of this (<i>syns.</i> Fulleri, pubigerum, Reevesii, and wallichianum).	— foliis aureis, golden lvs. prinulinum, flowers 1½" across, grh., creamy wh. Sambac, 6', aut., st., wh. : the double form of this species is a desirable plant.
multiflorum, 10', win., yel.	
officinale, 20', sum., hdy.,	

Other Species :—

angustifolium, 10', sum., st., wh.	odoratissimum, 4', Je., hdy., wh.
auriculatum, 4', sum., st., wh.	pubescens, 4', Je., st., wh. (<i>syns.</i> hirsutum and multiflorum).
capense, 8', My., grh., wh.	pubigerum (<i>see</i> humile).
floridum, 10', Jy., hdy., yel. (<i>syn.</i> subulatum).	revolutum (<i>see</i> humile var).
fruticans, 10', Jy., hdy., yel. (<i>syns.</i> collinum and heterophyllum).	simplicifolium, 5', Je., st., wh. (<i>syn.</i> gracile).
gracile (<i>see</i> simplicifolium).	subulatum (<i>see</i> floridum).
hirsutum (<i>see</i> pubescens).	undulatum, 5', Jan., st., wh.
multiflorum (<i>see</i> pubescens).	

JATEORHIZA.

A herbaceous perennial (*ord.* Menispermaceæ) of little horticultural value. It requires a stove temperature, and is propagated by cuttings in sandy soil beneath a bell-glass. Loam and peat, with sand, suit.

Only Species :—

Columba, 3', sum., pale grn. (*syns.* palmata and Cocculeus palmatus). Columba Root.

JATROPHA.

Stove evergreen shrubs (*ord.* Euphorbiaceæ) having considerable economic value. Propagation,

Jasminanthes (*see* Stephanotis).

Jasmine, Bor (*see* Phillyrea).

Jasmine, Rock (*see* Androsace).

by cuttings of firm shoots in very sandy soil beneath a bell-glass over bottom heat, or by seeds when procurable. Soil, fibrous peat, loam, and coarse sand.

Principal Species :—

Curcas, 4', sum., yel. podagrica, 2', sum., or. Purging Nut. red.

JEFFERSONIA.

A hardy herbaceous perennial (*ord.* Berberidæ) that will grow in any well-drained garden soil. Propagated by division in spring, or by seeds.

Only Species :—

binata, 6", My., wh. (*syn.* diphylla).

JERDONIA.

Stove perennials (*ord.* Gesneraceæ). Propagation, by cuttings of new growth, in sandy soil, in heat. Soil, sandy loam, with leaf mould. A lower temperature and drier conditions are necessary during winter.

Principal Species :—

indica, 4", Oct., Nov., crim., lil.

JERUSALEM ARTICHOKE (*see* ARTICHOKE).

JESSAMINE (*see* JASMINUM).

JONQUIL (*see* NARCISSUS).

JUANULLOA.

Stove evergreen shrubs (*ord.* Solanaceæ). Propagation, by cuttings in very sandy soil beneath a bell-glass over bottom heat. Fibrous loam with coarse sand suits.

Principal Species :—

aurantiaca, Je., or. (*syns.* parasitica and Brugmansia floribunda).

JUBÆA.

A tall greenhouse Palm (*ord.* Palmæ) that is raised from imported seeds and flourishes in sound loam. The only species is spectabilis, which is 25' high, and is remarkable for its bulky stem. A specimen at Kew has a girth of about 13' at 4' from the ground. The popular title of this species is Coquito Palm; its fruits have occasionally been sold in London as "Little Cokernuts."

Jehlia (*see* Lopezia).

Jenkinsia (*see* Aerostichum).

Jenkinsonia (*see* Pelargonium).

Jerusalem Cherry (*see* Solanum Pseudo-capricum).

Jerusalem Sage (*see* Phlomis).

Jerusalem Thorn (*see* Parkinsonia aculeata).

Jesuit's Nut (*see* Trapa natans).

Jew Bush (*see* Pedilanthus).

Jew's Apple (*see* Aubergine and Solanum Melongena).

Jezabel (*see* Freycinetia).

Job's Tears (*see* Coix).

Jocaste (*see* Smilacina).

Joe Pye Weed (*see* Eupatorium purpureum).

Johnia (*see* Salvia).

Joint Fir (*see* Ephedra).

Joliffia (*see* Telfairia).

Jonesia (*see* Saraca).

Josephia (*see* Dryandra).

Joseph's Coat (*see* Amaranthus splendens).

Jorellana (*see* Culecolaria).

Jove's Fruit (*see* Lindera).

JUGLANS. (WALNUT.)

Description.—Handsome, hardy, deciduous trees (*ord.* Juglandæ), useful ornamental subjects for garden or park, and possessing considerable economic value by reason of their edible Nuts and fine timber.

Propagation.—By seeds (Nuts) sown in autumn or spring; and by grafting or budding for choice varieties.

Soil.—Any deep, fertile soil suits Walnuts.

Principal Species and Varieties:—

cinerea, 30', spr., grn. (*syns.* *cathartica*, *oblonga*, and *Carya cathartica*). Butter Nut.
cordiformis, 30' to 40', lvs. often 2' long.
nigra, 30', spr., grn. (*syn.* *Pitteursii*).
regia, 50', Apr., grn. (*syn.* *kumaonensis*). Several distinct forms, such as *laciniata*, *longirostris*, *maxima*, *monophylla*, *pendula*, and *praparturiens*. Common Walnut.

Other Species:—

alba (*see* *Carya tomentosa*).
fraxinifolia (*see* *Pterocarya caucasica*).
pyriformis, hybrid (*nigra* × *regia*).
rupestris, small elegant lvs.
sieboldiana, 30', spr., grn. (*syns.* *ailantifolia*, *mandshurica*, *ailantifolia*, and *macrophylla*).
sulcata (*see* *Carya sulcata*).

JUNCUS.

Hardy bog plants (*ord.* Juncæ) of no special value for garden cultivation.

JUNIPER MOTH.

The small grey and white moth known to entomologists as *Ypsolophus marginellus* is known to horticulture as the Juniper Moth. The larvæ are hatched early in June, and at once spin a web on the erect-growing Irish Juniper, drawing the leaves together and thereby making the shrubs unsightly. Having done this the voracious little pests feed upon the foliage and so cause considerable damage. Hand-picking and vigorous hosing will arrest the enemy, but spraying the trees in May with a weak kerosene emulsion (*see* **INSECTICIDES**) is more effective.

JUNIPERUS.

Description.—Well-known half-hardy and hardy evergreens (*ord.* Coniferæ), valuable as specimens on lawns, where very tall shrubs would not be suitable, and equally useful in borders and shrubberies.

Propagation.—By seeds, sown at almost any time; they are very slow in vegetating, sometimes taking eighteen to twenty-four months. Or by cuttings in late summer in a shady position in firm soil and preferably covered with hand-lights.

Soil.—The Junipers like a deep, sandy, well-drained loam, but they are not fastidious in this respect, and will make shapely trees in all but the poorest soil.

Economic Properties.—The fruits of the Common Juniper are used for flavouring gin, while those of the Savin (*Sabina*) have diuretic properties. A great deal of the light brown, fragrant wood used for cedar pencils is produced by *bermudiana* and *virginiana*.

Judas Tree (*see* *Cercis*).

Juniper Lotus (*see* *Zizyphus Lotus*).

Juliana (*see* *Choisya*).

June Berry (*see* *Amelanchier*).

Principal Species and Varieties:—

chinensis, 12', My. (*syns.* *japonica* and *Thunbergii*); the golden var. *aurea* makes a fine lawn specimen, as also does *albo-variegata*.
communis, 5', My.; good vars. are *alpina* (*syn.* *canadensis*), *fastigiata* (*syn.* *hibernica*), *glauca*, and *oblonga*. Common Juniper.
drupacea, 4', My.
excelsa, 30'; *stricta* is a good garden form.
rigida, 4', My.
Sabina, 4', My.; low-growing forms suitable for rock gardens are *procumbens*, *prostrata*, *tamariscifolia*, and *variegata*.
Sanderi, glaucous, grn., dense heads, small and compact (*see* p. 457).
virginiana, 30', My.; the best garden forms are *argentea*, *aureo-variegata*, *glauca*, *pendula*, *Schottii*, *pendula*, and *viridis*. Red Cedar.



JUNIPERUS VIRGINIANA.

Other Species and Varieties:—

bermudiana, 20', My., grh. Bermuda Cedar.
macrocarpa, 12', My. (*syns.* *neaborensis* and *sphaerocarpa*).
occidentalis, 12', My. (*syns.* *dealbata* and *pyriformis*).
Oxycedrus, 15', My. (*syn.* *rufescens*).
pachyphloea, 6', My.
phenicea, 20', My. (*syns.* *bacciformis* and *tetragona*).
recurva, 4', My.; good vars. are *pendula* and *squamata*.
spherica, 30', My. (*syns.* *chinensis* *Smithii*, and *Fortunei*); *glauca* (*syn.*

Juniper's Tears (*see* *Verbena officinalis*).

Jupiter's Beard (*see* *Anthyllus Barba-Jovis* and *Sempervivum Tectorum*).

Jupiter's Distaff (*see* *Salvia glutinosa*).

Sheppardii) is a good form.
taxifolia, 4', My. (*syn.* *oblonga pendula*).
thurifera, 10', My. (*syn.* *bonatiana*, *cinerea*, *hispanica*, and *sabinoidea*).

JURINEA.

Hardy herbaceous perennials (*ord.* *Compositae*). Propagated by division in spring, or by seeds sown at that time. Any fertile garden soil suits.

Principal Species :—

alata, 3', Jy., vio. *spectabilis*, 1', Je., pur.

JUSSIEA or JUSSIEUA.

Stove biennials and perennials, nearly all aquatics (*ord.* *Onagrarieae*). Propagated by division, cuttings, or seeds, the process being very easy. Soil, sound loam.



Photo: Cassell & Company, Ltd.

JUNIPERUS SANDERI (see p. 456).

Principal Species :—

grandiflora, 1½', Aug., grh., yel. : not aquatic. *ovalifolia*, 1', Jy., yel.

Other Species :—

frutescens, 2', Je., shr., yel. *repens*, 1', Aug., yel.
natans, st. per., wh., suffruticosa, 1½', Aug., yel.
 aquatic. (*syn.* *exaltata*).

JUSTICIA.

Botanists have merged most of this genus (*ord.* *Acanthaceae*) into *Jacobinia*. The genus comprises annuals, biennials, and herbaceous and shrubby perennials, all requiring warm greenhouse or stove treatment. The annuals and biennials, which are not much grown, can be raised from seeds, and the others from cuttings in very sandy soil in heat. A constant succession of young plants should be maintained. Soil, peat and loam, with sharp sand.

Jussieu (see *Jussieu*).

Principal Species :—

[The synonymy is that of the *Kew Hand-List*, 1899].

calycotricha, 2', Feb., yel. (*syn.* *flavicomma*).
carnea, 3', Aug., flesh (now *Jacobinia magnifica* var.).
coccinea, 4', win., sc. (now *Jacobinia coccinea*).
comata, 2', sum., pur. (now *Dianthera comata*).
flavicomma (see *calycotricha*).
cha of *Botanical Magazine* 2816).
furcata, 4', Ap., trailer, vio.
gendarussa, 1½' to 3', Jy., ro., pur.
ghiesbreghtiana, 1½', win., sc. (now *Jacobinia ghiesbreghtiana*).
magnifica, 3' to 10', Aug., ro. (now *Jacobinia magnifica*).
 — *pohliana*, sc.

KADSURA.

Evergreen shrubs (*ord.* *Magnoliaceae*), with thick, leathery leaves and white flowers, suitable for a wall out of doors, or for a cold greenhouse. Propagation, by cuttings. Soil, light loam.

Principal Species :—

chinensis of Hance (correctly *Schizandra hanceana*).
chinensis of Turez (*Schizandra japonica*), correctly *Schizandra chinensis*.

KÆMPFERIA.

Ornamental, herbaceous perennials (*ord.* *Scitamineae*), requiring stove culture. They have large or small, rather fleshy, oval or roundish leaves, springing from a tuberous rootstock, and produce terminal spikes of flowers during summer on stout, leafy stems. Careful division is a good means of increase at the time of potting in spring. Well-drained pots should always be provided, and a light mixture of two parts fibrous peat, one part fibrous loam, with one part of chopped sphagnum and charcoal, and a fair quantity of sand, given. During the growing period a good supply of water is necessary, checking the amount as the leaves begin to turn yellow in autumn. During winter a long rest must be given.

Principal Species :—

atrovirens, 9", vio., pur. (*syn.* *Cienkowskia Kirkii*).
Ethele, 2', spr., ro., pur., yel. blotch.
Galauga, 1', Jy., Aug., wh., pur.
Gilbertii, 1', grown for its grn. and wh. variegated lvs.
Kirkii, 6", Aug., ro., pur.,

Other Species :—

angustifolia, 6" to 8", wh., lil.
elegans, 1', sum., pur.
marginata, 1', Jy., bl.
secunda, 1', sum., pur., wh.
vittata, 9", Aug., handsome lvs.

KAGENECKIA.

Half-hardy shrubs or small trees (*ord.* *Rosaceae*), of little horticultural value.

KALANCHOE.

Description.—Erect-growing, succulent-stemmed plants (*ord.* *Crassulaceae*), from a few inches to 2' or 3' in height. The leaves are fleshy, sometimes glaucous. The flowers are usually in terminal, flattened heads. Of the numerous species a few

Jute Plant (see *Cochorus capsularis*).

Kæmpferia (see *Tamonea*).

Kaffir Bean Tree (see *Schotia*).

Kaffir Lily (see *Schizostylis*).

Kaki (see *Diospyros*).

only make really ornamental plants. *Flammea*, a recent introduction from Somaliland, is by far the best. It was introduced a few years ago through the Royal Gardens, Kew, seeds having been sent to that establishment by Mrs. Phillips, who collected them in Somaliland. It grows 2' to 2½' high, and produces large heads, often 1' or more across, of orange scarlet flowers, which last in good condition for six weeks in early summer.

flowers may be obtained. From the cutting or seedling to the mature plant a check should never be given.

Principal Species :—

carnea, 1½', flesh.
grandiflora (of gardens *see*
marmorata).

flammea, 2' to 2½', sum.,
or. sc. (*see figure*).
marmorata, 2', sum.,
wh.



KALANCHOE FLAMMEA.

Propagation.—This is effected by means of seeds or cuttings.

Soil.—Fibrous loam two-thirds, the other third being made up of leaf mould, sand, and small crocks.

Other Cultural Points.—Young plants should be grown in a tropical house for the first six months, afterwards transferring them to a warm greenhouse. When about thirteen months old the inflorescences will begin to show, after which time plenty of air should be allowed, and the plants fed with weak liquid manure. Plants can be well grown and flowered in 5" or 6" pots, and by stopping the plants once when young, several heads of

Other Species :—

coccinea, 2', sum., red.
crenata, 2', Aug., yel.

rotundifolia, 2', Jy., wh.
spathulata, 2', Jy., wh.

KALE (*see* BORECOLE and SEAKALE).

KALMIA.

Description.—Hardy evergreen shrubs from North America, with very ornamental flowers. About six species are known, of which three are usually seen in cultivation. *Kalmias* should never be planted in ground containing lime, and they never do well on a hot, dry soil. In addition to being good outdoor plants they are useful for forcing to use indoors in spring.

Propagation.—Cuttings of half-ripe shoots can be rooted in July if taken with a small heel of old wood, and inserted firmly in pots of very sandy peat placed in a cool, close propagating case. Seeds may also be sown as soon as ripe, or in spring, using well-drained pans of sandy peat. One or two species may also be increased by division of the clumps, whilst all can be increased by layers.

Soil.—Moist, peaty soil, from which superfluous moisture drains quickly away, is the most suitable.

Principal Species and Varieties:—

angustifolia, 2' to 3', Je., crim. The following vars. differ in height and colour; all are good: lucida, nana, ovata, rosea, and rubra.	glauc, 1' to 2', My., lil. pur. latifolia, anything up to 20', sum., ro. or wh. Calico Bush. —myrtifolia, small leaved. —poly petala, abnormal number of petals.
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Other Species:—

cuneata, 2', My., Je., wh.	hirsuta, 1', sum., ro. pur.
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KALOSANTHES (see ROCHEA and CRAS-SULA).

KARATAS.

Tropical evergreen plants, often with ornamental foliage (*ord.* Bromeliaceæ). For culture, see BILLBERGIA.

Principal Species:—

acanthocroter, 1', sum., red and grn. bracts, bl. flowers.	bracts, bl. flowers, with red calyx.
ampullacea, bl., grn., wh. (<i>syn.</i> Nidularium ampullaceum).	humilis, 1½', sum., blood red bracts, reddish pur. flowers.
Carolinae, 1½', sum., red and grn. bracts, bl. and grn. flowers (<i>syn.</i> olens).	Innocentii, 1', sum., or. bracts, grn. and wh. flowers; var. striata.
coriacea, 1', sum., reddish pur. bracts, grn. and bl. flowers.	Pumieri, 1½', sum., red bracts, reddish pur. flowers.
fulgens, 1', deep red	rutilans, vermilion (<i>syn.</i> Nidularium rutilans).

KAULFUSSIA.

A small genus of tropical Ferns (*ord.* Filices), found in Assam and the islands in the neighbourhood of the Malay Peninsula. The principal species is *asculifolia* (*syn.* *assamica*), commonly called the Chestnut-leaved Fern. It is a curious plant, and grows about 1½' in height. It thrives under similar treatment to that usually accorded to a general collection of stove Ferns. There has also been a genus of Compositæ called *Kaulfussia*, but this is now sunk in *Chariex*.

KEDROSTIS.

A genus of stove and warm greenhouse climbing plants (*ord.* Cucurbitaceæ) with perennial roots. Seeds should be sown early in March in well-drained pans of sandy loam, in bottom heat. The plants may then be given the same general treatment as accorded to Melons, using a rich loam. *Africana* is the only species introduced; this has

Kalosanthos versicolor (see *Rochea versicolor*).
Kambala Tree (see *Sonneratia apetala*).
Kangaroo Apple (see *Solanum aviculare*).
Karlinia (see *Pluchea*).
Kaulfussia (of Nees, see *Chariex*).
Kauri Pine (see *Dammara australis*).

greenish flowers, and red, berry-like fruits, in August and September.

KELP.

A term used for the ash left behind after Sea-weed has been burnt. Kelp is rich in potash, containing over 17 per cent., hence its value as food material for the Cabbage tribe, Potatoes, and other crops.

KENDRICKIA.

A new and promising stove climber (*ord.* Melastomaceæ), described as being the loveliest and most desirable of Ceylon plants. Walkeri, the only species, has umbels of large, bright red flowers, somewhat fleshy leaves, and self-clinging stems. Cuttings root with freedom, and the plant thrives in a mixture of peat and sandy loam, with a little charcoal and sandstone to ensure porosity.

KENNEDYA.

Evergreen climbing or trailing shrubs or sub-shrubs (*ord.* Leguminosæ), suitable for a cool greenhouse. Propagation, by seeds or cuttings. Soil, equal parts of sandy, fibrous peat and loam. After flowering, side shoots require shortening back to within an eye or two of the old wood. During the growing season water should be given freely.

Principal Species:—

coccinea, 15', sum., sc.	prostrata, shoots 2' to 3', spr., sc.; good for baskets.
heterophylla (see coccinea).	—Marryattæ, lvs. more hairy than type.
inophylla (see coccinea).	rubicunda, 15', sum., sc.
nigricans, 20', sum., grn., blk.	

Other Species:—

comptoniana (correctly Hardenbergia comptoniana).	latifolia (correctly Hardenbergia monophylla).
cordata (correctly Hardenbergia monophylla).	ovata (correctly Hardenbergia monophylla).

KENTIA.

Description.—Elegant Palms (*ord.* Palmæ), requiring stove or intermediate house treatment. The genus is closely allied to *Areca*, *Hedyscepe*, etc., and most of the species at one time included in *Kentia* are now placed in other genera.

Propagation.—Imported seeds germinate readily in a brisk bottom heat. As soon as two leaves are made the young plants should be placed singly in thumb pots.

Soil.—Good, fibrous loam, with a little peat or leaf mould, and coarse sand.

Other Cultural Points.—Young plants are benefited by being plunged in a bed where they can obtain bottom heat. It is not advisable to give very big shifts, the plants being far more ornamental when seen in medium sized pots. The various species make excellent room plants. The leaves should be sponged occasionally with strong soft soap water.

Principal Species:—

australis.	Luciani.
elegantissima.	sanderiana.
kersteniana.	

Keertia (of De Candolle, see *Leucopsidium*).
Kiefersteinia (see *Zygopetalum*).
Kellana (see *Euclea*).
Kelletia (see *Prockia*).

Other Species :—

belmoreana (correctly
Howea belmoreana).
canterburyana (correctly
Hedyscepe canterbury-
ana).
elegans (correctly Cypho-
phoenix elegans).
forsteriana (correctly
Howea forsteriana).

Lindenii (correctly Kenti-
opsis macrocarpa).
Macarthuri (correctly
Ptychosperma Macar-
thuri).
wendlandiana (correctly
Hydriastele wendland-
iana).

KENTIOPSIS.

Stove Palms (*ord.* *Palmae*), closely allied to, and to some extent resembling, *Kentia*. They require similar treatment to *Kentias* and *Howeas*, but are not very largely grown.

Principal Species :

macrocarpa.

oliviformis.

called *Corchorus japonicus*. Cuttings of young shoots root quickly, and soon make flowering plants. Almost any sort of garden soil suits. After flowering it is a good plan to thin out old flowering shoots. Both the type and the double form are excellent plants for early forcing.

KETELEERIA.

A small genus of hardy evergreen Conifers (*ord.* *Coniferae*) allied to *Abies*, and until recently included in that genus. For cultural details, refer to *ABIES* and *PINUS* (*syns.* *Abies*, *Picea*, and *Pinus* *Fortunei*, and *Abies jezoensis*).

Principal Species :—

davidiana, 5' to 6' long,
 2½" in diameter, cones
 pendulent; a tall, spread-
 ing tree.

Fortunei, a curious Coni-
 fer, very rare in culti-
 vation.



THE POPULAR PALM *KENTIA BELMOREANA*, NOW CALLED BY BOTANISTS *HOWEA BELMOREANA*.

KERRIA.

One species only, *japonica* (*ord.* *Rosaceae*), is known. It is a handsome, hardy shrub, growing 4' to 10' high, with pretty golden blossoms 1" across, produced in April and May. There are two varieties in cultivation, one, much dwarfer than the type, called *variegata* by reason of its white variegated leaves; the other a very strong, double-flowered form called *flore pleno*. The latter was introduced many years before the typical plant, and was a great puzzle to botanists to name. For a long while it was thought to be a species of *Corchorus*, and by some people is still

Kentranthus (see *Centranthus*).
Kentrophyllum (see *Arthamus*).
Kentucky Coffee Tree (see *Gymnocladus canadensis*).
Kepleria (see *Oncosperma*).
Kepleria (of *Martius*, see *Bentinckia*).
Kerchonea (see *Stromanthe*).
Kerosene Emulsion (see *Insecticides*).

KIELMEYERA.

Stove evergreen shrubs or small trees (*ord.* *Ternstroemiaceae*), with oblong or ovate leaves and racemes of showy flowers. Although a number of species are known, very few are in cultivation.

Principal Species :—

angustifolia. *corymbosa*. *excelsa*, 60', Jy., wh.

KINGIA.

An evergreen genus (*ord.* *Juncaceae*). One species only is known, *australis*. The flowers are

Kerria, White (see *Rhodotypos*).
Kidney Bean (see *Beans*).
Kidney Bean (of *Malacca*, see *Semecarpus Anacardium*).
Kidney Potatoes (see *Potatoes*).
Kidney Vetch (see *Anthyllis*).
Kisleria (see *Bonnetia*).
Kilmarnock Weeping Willow (see *Salix Caprea pendula*).

minute, and are borne in a large globular head from the centre of the plant. It can be grown in peat.

KITAIBELIA.

Hardy or half-hardy perennial herbaceous plants (*ord.* Malvaceæ). They grow 2' or 3' high, with Malva-shaped leaves and flowers. Propagation, by seeds. Loamy soil.

Principal Species :—

vitifolia, 2', sun., hlf.-lidy., wh.

KITCHEN GARDEN.

Aspect and Exposure.—In laying out a kitchen garden the designer, if he has any choice in the matter, should select a site sloping to any point between south-east and south-west in preference to any other quarter. The best direction is a little to the south-east, for then the garden will get the benefit of the sun from the early morning till late in the day; and in the case of spring frosts upon the blossom of fruit trees, the sun will gradually thaw it before getting so powerful as to act suddenly and with destructive force upon the frozen blossoms, which it would do if obstructed till 10 a.m. or later. The free passage of air is equally conducive to well-flavoured and healthy vegetables. A stagnant atmosphere is favourable to the rapid increase of insect pests and fungoid diseases, and should be avoided.

Slope and Elevation.—The slope of the ground should be gentle rather than excessive, the most convenient declivity or dip being somewhere between 1' in 20' and 1' in 30'. This will favour the proper exposure of the vegetables and other subjects grown to the influence of the sun, and at the same time make the gradients easy for the wheeling of manure to the various quarters, and for the conveyance to and fro of other necessary material. Heavy rains and thunder showers are often very destructive to gravel walks and paths on steep declivities. High elevations should be avoided, as the garden in such a situation is unnecessarily exposed to the influence of violent winds, and vegetation, of whatever kind, is subject to injury. Low situations are equally to be avoided, especially in the case of fruit trees, which are liable to irreparable injury from late spring frosts, because the air is always coldest at low elevations, night dews lie heavily upon everything, and if near water the atmosphere is often excessively damp.

Shelter.—Walls are indispensable for the proper development and maturation of such fruits as Peaches, Nectarines, and Apricots, and for accelerating the ripening of Cherries, Gages, and choice early Plums. The highest walls should be built round the north, north-east, and north-west end of the garden, and thence they may be gradually lowered towards the south. The walls at the north end may also form the back wall of vineries and other fruit houses, while they will also hide the bothies, potting sheds, and other conveniences on their northern aspect. Trees will be found indispensable for furnishing shelter from the north, north-east, and north-west. Similar shelter is desirable to protect fruit trees from the

force of south-westerly gales when laden with fruit in autumn. Such trees should be at a sufficient distance from the garden walls not to overhang or even unduly shade them. Nor should the rays of the rising sun be unduly obstructed on the eastern side of the garden, whether by trees or tall buildings.

Size.—About a rood of ground will produce sufficient vegetables for a family of three or four, exclusive of servants; but this depends upon the love or otherwise which the family may have for vegetables. Where the owner desires a long succession of vegetables, and many out of season by forcing or otherwise, the area for their production must be increased in proportion. It is better, however, to have the garden somewhat larger than is actually necessary, to furnish plenty, to anticipate and guard against loss, and to allow of extras in certain cases. About two acres of ground are all that one man can work properly, with some assistance at busy times.

Soil.—The best and richest land obtainable (other things being equal) should be selected for the site of a kitchen garden. A depth of 2½' to 3' of good soil is always desirable; and if most of it is of the nature of a clayey loam, with a smaller area of it of a rich but light and sandy nature for early crops, so much the better. It is easier to improve a heavy than a light and poor soil.

KLEINHOVIA.

One species only of this genus (*ord.* Sterculiaceæ), *hospita*, is known. It is an Indian evergreen tree, with handsome leaves and large, drooping panicles of pink flowers. Propagation, by cuttings. Soil, fibrous peat and loam. A stove temperature is required.

KLEINIA.

A genus (*ord.* Compositæ) allied to *Senecio*. The majority have stems of a succulent character, and flourish under similar treatment to *Cactus*, which *sec.* Propagation is by cuttings, which should be slightly dried before insertion. Soil, loam, leaf mould, broken crocks, and sand, with good drainage.

Principal Species :—

<i>Anteuphorbium</i> , 3' to 4', Jan., grh., yel.	<i>neriifolia</i> , 4' to 6', Jan., grh., yel.
<i>articulata</i> , 1½', Sep., grh., yel. (<i>syn.</i> <i>Cacalia articulata</i>).	<i>pendula</i> , Oct., grh., bright vermilion, or, stems crooked (<i>syn.</i> <i>Senecio Gunnisii</i>).
<i>ficoides</i> , Jy. to Oct., grh., wh.	<i>radicans</i> , 6'', Je., grh., yel. (<i>syn.</i> <i>Cacalia radicans</i>).
<i>fulgens</i> , 2' to 3', My., grh., or, ver.	<i>repens</i> , Je., wh., near <i>ficoides</i> but more glaucous.
<i>Galpini</i> , 1' to 2', Sep. to Nov., grh., or.	
<i>Grantii</i> , 6'' to 8'', Je., grh., sc. (<i>syn.</i> <i>longipes</i>).	

KLUGIA.

A small genus of stove evergreen herbs (*ord.* Gesneraceæ). Propagation, by cuttings in sand in a case or frame in heat. Soil, light, sandy loam, with a third of peat, and sand.

Principal Species :—

<i>notoniana</i> (<i>sec.</i> <i>zeylanica</i>).	ana of <i>Botanical Magazine</i> .
<i>zeylanica</i> , 1', Sep., bl., yel., wh. (<i>syn.</i> <i>notoni-</i>	

King of the Woods (*sec.* *Anacardilus*).

King of the Woods, Striped (*sec.* *Zeurine regium*).

King Plant (*sec.* *Anacardilus regalis*).

Kinkiana (*sec.* *Cinchona*).

Kirganella (*sec.* *Phyllanthus*).

Klopstockia (*sec.* *Ceroragium*).

Knaulia (*sec.* *Scabiosa*).

Knee Pine (*sec.* *Pinus montana*).

KNIGHTIA.

A small genus of evergreen, greenhouse trees (*ord.* Proteaceae). Propagation, by cuttings of mature shoots in very sandy soil, removing only a few of the basal leaves to admit of insertion. Soil, peat, with a little loam and plenty of sand. Treat them like Heaths, summer and winter.

Principal Species :—

excelsa, 10', grh., flesh.

KNIPHOFIA. (FLAME FLOWER, TORCH LILY, OR RED-HOT POKER.)

Description.—The *Kniphofia* (*ord.* Liliaceae), still commonly known in many gardens as the *Tritoma*, a superseded name, is one of the most brilliant and conspicuous plants in the garden in autumn. The larger forms are remarkably striking, with their tall stems surmounted by spikes of tube-shaped, vivid scarlet or yellow flowers; while some of the dwarfier species are capital for the small

and should have the leaves tied over the crowns in sheaf-like fashion to throw off the winter rains. These old leaves ought not to be removed until a little new growth is made. In dry soils *Kniphofias* should have plenty of water in summer, and they are much benefited by having a supply of well-rotted manure applied within reach of the roots in spring. Severe drought is very injurious.

Principal Species and Varieties :—

aloides, 4', aut., red, yel.; the common species (*syn.* *Uvaria*), several forms. *Glaucescens*, *grandis*, *nobilis*, and *Saundersii* are all good (*see also* named varieties and hybrids below). *caulescens*, 5', sum., salmon red; very distinct. *corallina*, 2', aut., sc. — *superba*, sc.

Leichtlinii, 4', sum., red, yel., protruding anthers. — *distachya*, yel. *longicollis*, 4' to 5', Dec. to Feb.; grh. or cold frame, lemon yel. (*syn.* *primulina*, *see plate*). *Macowanii*, 2', aut., coral red (*see figure*). *Rooperi*, 4', aut., red, yel. *Tuckii*, 4' to 5', Je., yel., red.



Photo: Cassell & Company, Ltd.

KNIPHOFIA MACOWANII.

border or the rock garden. They have a grand effect in the shrubbery against the dark background made by evergreen shrubs, and are fine subjects for the margins of ponds, but above the water level. *Rooperi* is of special value on account of its continuous blooming properties in mild districts, where it is seldom out of flower. *Tuckii* is among the earliest to bloom. All, unless otherwise mentioned, are hardy except in very cold districts.

Propagation.—By division in spring, when large enough, or by seeds sown under glass in spring in slight heat.

Soil.—The *Kniphofia* likes a good, fertile loam, where it is not too dry.

Other Cultural Points.—The crowns should be about 3" below the surface in cold districts,

Knight's Star (*see Hippeastrum*).

Other Species and Varieties :—

breviflora, 2', aut., grh., yel. *Burchelli*, 1½', aut., sc., yel. *comosa*, 2', aut., yel., tender. *foliosa*, 3', aut., yel., tender. *modesta*, 2½', aut., wh., tender. *multiflora*, 4', late aut., wh., tender. *natalensis*, 2', aut., yel. — *condensata*, closer spike.

Nelsoni, 2', Oct., sc. *Northiae*, 5', sum., yel. (*see p.* 463). *pallidiflora*, 1½', aut., whitish, tender. *pauciflora*, 1', aut., lemon yel. *præcox*, 3', aut., red, yel. *pumila*, 1', aut., yel., tender (*syn.* *quartiniana*). *rufa*, 1½', aut., red, yel. *sarmentosa*, 3', aut., red. — *hybrida*, red, a fine foliage plant.

Selection of Named Varieties and Hybrids :—

Autumn Glory, 4', yel. *Chloris*, 3', deep yel. *Cloto*, 3', car.

Diana, 2½', chrome. *Franz Buchner*, 4', or. *Henry Cannell*, 5', crim.



THE PALE YELLOW KNIPHOFIA LONGICOLLIS, A BEAUTIFUL SPECIES OF
TRITOMA OR POKER PLANT.

Lachesis, 6', apricot.
Matador, 4', crim.
Monarch, 6', or. sc.
Obelisque, 4', yel.

Pfitzeri, 4', or. sc.
Star of Baden-Baden, 6',
yel., or.
Triumph, 4', yel.

[NOTE.—For illustrations of other KNIPHOFAS, see FLAME FLOWER.]

KNIVES.

Garden knives are of various forms according to the purposes for which they are used. In all cases where a clean cut is required they should be of the best quality—that is, of well-tempered steel, so that they may take and retain a good edge when sharpened. Pruning knives should be fairly strong, with a buckhorn handle and a curved blade for cutting large branches when necessary, and for removing spurs and dead snags from fruit trees. Propagating and budding knives should be lighter, but of the best quality, with an ivory handle and a straight blade, rounded off at the point in the case of those used for budding. Knives for cutting

Principal Species :—

brachycarpa, Jy., st., pk.
(syn. laevis).
corymbosa, 2' to 3', sum.,

st., wh. or pur. (syns.
exserta, sumatrensis,
teres, and umbellata).

KOCHIA.

A genus of hardy annuals (ord. Chenopodiaceae), of which only one, scoparia, is in general cultivation. Seeds may be sown in the open in any light soil in April. It also makes a very elegant pot plant for the cool conservatory, as it has delicate fern-like foliage and grows to a height of 2'. The flowers are greenish white and inconspicuous. The foliage, which is soft green in summer, becomes rich red in autumn (see p. 464).

Only Cultivated Species :—

scoparia, 2', handsome lvs. (see p. 464).

KELREUTERIA.

A small genus of hardy trees (ord. Sapindaceae), with ornamental deciduous leaves and yellow flowers. They delight in sunny, sheltered situa-



Photo: Cassell & Company, Ltd.

KNIPHOFIA NORTHLÆ (see p. 462).

and dressing vegetables should have a long, curved blade, though the ordinary pruning knife is often made to serve the purpose. A special knife with a saw-like blade is used for cutting Asparagus.

KNOWLTONIA.

Perennial herbs (ord. Ranunculaceae), having white, yellow, or green flowers. Propagation, by division or seed. Soil, loam, with a third of peat and a good sprinkling of sand.

Principal Species :—

vesicatoria, 1½', Feb. to Ap., grh. or hlf-hdy., yel., grn.

KNOXIA.

Evergreen herbs or sub-shrubs (ord. Rubiaceae). Propagation, by cuttings in spring, in very sandy soil under a bell-glass. Soil, peat and loam in equal parts, with sand. Night temperature in winter 50°, in summer 60°, rising 10° to 20° by day.

Knol Kohl (see Kohl Rabi).

Knot Grass (see Polygonum).

tions. Propagation, by seeds in spring, cuttings under a hand-light in summer, layers in autumn, and root cuttings in spring. Any well-drained, good garden soil.

Principal Species :—

bipinnata, 10', yel.

paniculata, 10' to 20',
Aug., yel.

KOHL RABI.

The Turnip-stemmed Cabbage (*Brassica oleracea caulorapa*) is also known as Knol Kohl and Cape Cabbage (ord. Crucifere). The stem grows to various heights, according to the variety and soil, then swells out at the top in globular form, resembling a Swede, with the leaves distributed all over the sides and top. Propagation, by seeds in beds from March to July for succession, and the seedlings planted out when fit, 8" apart in rows 15" asunder, the treatment throughout being precisely like that given to Cabbages. Any well-manured and good garden soil will suit them. The varieties vary in size and colour. The very large forms are grown in the field to feed cattle. Early Vienna (green) and Early Purple are good for table use; and, if cooked when young, make a delicious vegetable as a substitute for, or a change from, Turnips.

KÆNIGA.

The plants formerly called Koeniga are now included with the Alyssums. *Maritima* is *Alyssum maritimum*. (For this and the best of the others, see *ALYSSUM*.)

Principal Species :—

fruticosa, 2' to 3', My, red.

KORTHALSIA.

Stove Palms (*ord.* *Palmæ*). The stems are slender,



Photo: Cassell & Company, Ltd.

KOCHIA SCOPARIA (*see p.* 463).

KOPSIA.

Evergreen stove shrubs or trees (*ord.* *Apocynaceæ*), with white or rose coloured flowers. Propagation, by cuttings of young side shoots getting firm at the base, as in the case of *Poinsettias*, inserted in sand or very sandy soil in a propagating case. Soil, peat and loam in equal parts, with sand.

Köhleria (*see Isoloma*).

Kola Nut Tree (*see Cola*).

Kolpakowskia (*see Ixiolirion*).

spiny, and climbing. Propagation, by imported seeds in stove heat. Soil, loam, with a third of peat and plenty of sand. Plenty of water is required when they are in full growth.

Principal Species :—

Junghuhnii, st.

scaphigera, st.

Kordelestris (*see Jacaranda*).

Korolkowia Sewerzowii (*see Fritillaria Sewerzowii*).

Korsaria (*see Dorstenia*).

KOSTELETZKYA.

A small genus (*ord.* Malvaceæ), consisting of hardy herbaceous and stove and greenhouse herbs and shrubs. They are closely related to Hibiscus, and may be increased by seeds, division, and cuttings. The only species yet introduced is *virginica*, a hardy perennial with rosy pink flowers, produced on stems 2' to 5' in height in August.

KRAMERIA.

Evergreen stove or greenhouse shrubs (*ord.* Polygalæ) seldom seen in cultivation.

KREYSIGIA.

Perennial greenhouse herbs (*ord.* Liliacæ), allied to Uvularia and Tricyrtis. Propagation, by division before growth commences. Soil, fibrous loam and a little leaf mould, with plenty of sand.

Principal Species :—

multiflora, 1', Je., grh., ro.

KUHNIA.

Hardy or half-hardy, perennial herbs (*ord.* Compositæ), allied to Liatris. Propagation, by seeds when obtainable, and by division previous to growth in spring. Soil, fibrous loam, with some leaf mould and sand.

Principal Species :—

eupatorioides, 1½', Jy., rosmarinifolia, Jy., grh., hdy., wh. (*syn.* *Critonia*). wh.

KUNZEA.

Evergreen greenhouse shrubs (*ord.* Myrtacæ), with the habit of a Heath or Leptospermum. Propagation, by cuttings in sand and peat under a bell-glass in gentle heat. Soil, fibrous peat with a fourth part of loam and sand.

Principal Species :—

Baxteri, 2', red (*syn.* *peduncularis*, 2' to 10', Callistemon macro- Je., wh. stachyum). pomifera, berries, termed Muntries, made into jam by natives of Australia. *Leptospermum ambigu- curvata*, 2'. um). *ericifolia*, 2' to 6', Jy., wh.

KYDIA.

Evergreen stove trees (*ord.* Malvaceæ), allied to Abutilon and similar in habit. Propagation, by cuttings of half-mature side shoots in very sandy soil in a frame or case with stove heat. Soil, fibrous loam and peat in equal proportions, with plenty of sand.

Principal Species :—

calycina, 30', wh. (*syn.* *fraterna*).

KYLLINGA.

A large genus of perennial Sedges (*ord.* Cyperacæ) of tufted habit, like the species of Cyperus, and grown for their foliage. Propagation, by seeds when obtainable, and by division of the tufts. Soil, fibrous loam, with a little leaf mould and sand.

Kyritzia barbigera (*see Eritrichium*).

Kuhlia of Blume (*see Fagraea*).

Kumquat (*see Citrus Aurantium japonica*).

Kunthia deppeana (*see Chamædorea elegans*).

Kunzia (*see Purshia*).

Kurria (*see Hymenodictyon*).

Principal Species :—

monocephala, st., wh.

LABELS.

Many sorts of labels have been invented, and still the perfect label has yet to come. For pot plants the ordinary wooden slips smeared over with white or yellow paint and written upon with blacklead pencil are fairly satisfactory. The writing is, as a rule, legible until the wood itself decays. Wooden labels are cheap and readily replaced. Zinc labels, written upon with special metallic ink, have been tried, and to a large extent found wanting, as the writing often requires to be renewed. Celluloid tablets of various shapes, attached to copper wire stems, are largely in favour, both for pot plants and hanging baskets. For Orchids, and indeed all pot plants, they are suitable, being cheap and neat, and they do not encourage fungi as wooden ones do.

The paper labels used for attaching to plants that are being packed are, of course, satisfactory for that special purpose, but for no other. The best label for forest and fruit trees is the metal one with raised letters. This is either furnished with a stout iron shank or one of strong wire doubled. The only objection to this label is its costliness, but it will last a lifetime. Triangular strips of sheet lead, with the letters stamped in and rubbed over with white or red lead, are amongst the best labels for perennials and rockery plants; they are practically everlasting, but they are also rather costly. Large wooden tallies, 18" in length and 3" broad, are often seen in nurseries, but are unsightly. Strips of zinc may be employed, but the writing soon becomes illegible. Harry's patent zinc is an ingeniously constructed label in which the writing surface is detachable. It is supported on shanks of double wire, takes a firm grip of the ground, and is reasonable as to price. The celluloid label, enclosed in a glass-covered frame, looks neat, and is not very costly.

Earthenware labels, with the name painted on, are very durable. Zinc labels, attached by simply coiling a few inches of the strip round the branch, have the advantage of automatically giving room as the expanding branch calls for it. Generally speaking, however, metal labels with raised letters are, despite their cost, the best for fruit trees, as they are for ground work. They may be nailed to the wall, or hung to the stem or branches by copper wire. Galvanised wire should never be used; it seems to exercise a prejudicial effect upon the branches it touches. All labels should be loosely tied to the branches, so as to allow plenty of room for subsequent growth.

LABICHEA.

Greenhouse evergreen trees and shrubs (*ord.* Leguminosæ), little known. Propagation, by cuttings of the half-matured shoots in sand, under a bell-glass, in summer. Soil, sandy peat and loam in equal parts.

Principal Species :—

lanceolata, 6', grh., Ap., Je., yel. lvs. spiny (*syn.* *diversifolia*).

Kyllingia (*see Kyllingia*).

Kyrtanthus (*see Posoqueria*).

Labaria Plant (*see Dracontium*).

Labillardiera (*see Billardiera*).

LABISIA. (SPOONFLOWER.)

Small stove shrubs (*ord.* Myrsinæ), very rarely cultivated. Seeds are the only reliable means of increase. Soil, sandy loam two parts, peat one part. Plenty of water is required. The name Spoonflower is due to the petals being spoon-shaped.

Principal Species :—

alata, 1', st., wh., pk.,
small. *pothoina*, 1' to 1½', Je.,
st., wh., small.

deal of room. Laburnums associate well with Scarlet Flowering Thorns, as they bloom about the same time. The trees seed freely, but these seeds are poisonous. - Deaths amongst children who have eaten the seeds usually take place each year.

Propagation.—All the species reproduce themselves freely from seed, which should be sown in spring, but for special varieties budding and grafting are commonly resorted to. Grafting has given



Photo: Cassell & Company, Ltd.

LACHENALIA NELSONI (see p. 467).

LABURNUM. (GOLDEN CHAIN.)

Description.—A small genus of hardy trees and shrubs (*ord.* Leguminosæ), with showy flowers in pendulous racemes. The genus was formerly included under *Cytisus*, but is now considered distinct. Laburnums will grow almost anywhere, and as a rule flower freely each year, their pendulous flowers being beautiful in spring. The common Laburnum makes a good town tree. It is naturally of symmetrical habit, and does not need a great

rise to one curious graft hybrid, *Adami*, which resulted from grafting *Cytisus purpureus* on *Laburnum vulgare*.

Soil.—Any ordinary soil will do, but Laburnums prefer one of a light and rich character. Trees that have become established are much benefited by regular mulchings of good loam or well-rotted yard dung.

Other Cultural Points.—Little pruning is necessary with established trees, as when once they begin to flower this checks any tendency to make gross growth.

Lab-Lab (see *Dolichos*).

Labrador Tea (see *Ledum*).

Principal Species and Varieties:—

- Adami, My., dull pur.
(*syn.* *Cytisus Adami*).
—pendulum, pretty
drooping branches.
apinum, 15' to 20', Je.,
yel. (*syn.* *Cytisus al-*
pinus); fragrans, hir-
sutum, Parksii pendu-
lum, and Watereri are
vars. Scotch Labur-
num.
vulgare, 20', Ap., Je., yel.
(*syn.* *Cytisus Labur-*
num).
According to
Ludex Kewensis the cor-
rect name of this species
is *anagyroides*. There
are many vars., of which
those subjoined are the
best. Common Labur-
num.
—aureum, lvs. yel.
—involutum, lvs. curled
ringwise.
—quercifolium, lvs. like
Oak.
caramanicum, 3' to 4',
Je., yel.

Other Species:—

Alsingeri (correctly *Cy-*
tisus Alsingeri).

LACÆNA (*syn.* *NAWENIA*).

Stove epiphytic Orchids (*ord.* *Orchidaceæ*), allied to *Acineta*. They may be increased by division of the pseudo-bulbs, and by imported pieces. Soil, fibrous peat and chopped sphagnum, in equal parts, with sand. Teak baskets are better than pots, and they should be hung close to the roof in the warm Orchid house. Give plenty of water while the plants are growing, with little or none, and a cooler atmosphere, during the winter.

• Only Species:—

- bicolor, 12", sum., st., spectabilis, 10", early sum.,
cream, wh., blotched st., wh., ro. spotted.
pur., twenty to thirty
on a spike.

LACEWING FLIES.

Flies belonging to the order *Neuroptera*, with slender bodies and relatively large, gauzy wings. Green and yellow are the prominent colours. The eggs are attached to the branches of trees by means of hair-like threads, many often being together. The larvæ are about $\frac{1}{2}$ " long, have strong jaws, and are most voracious feeders. As they feed exclusively upon aphides, they must be numbered amongst the gardener's insect friends. It is interesting to watch the larva of a Lacewing Fly at work. It holds its victim firmly with its jaws, and keeps it there until it has sucked all the juices from its body. Some may be recognised by the unpleasant odour which they exhale when handled, whence the common name of Stink Flies.

Two genera are included—*Chrysopa* and *Hemerobius*. The members of the latter genus are rather smaller than the *Chrysopas*, but in one respect at least they differ in habit. The *Chrysopa* larva throws the skin of its victim away; the larva of the *Hemerobius* clothes itself with it, so that the hapless green fly is both food and raiment. Parasitism could scarcely go farther than this.

LACHENALIA.

A large genus (*ord.* *Liliaceæ*) of bulbous green-house plants.

Propagation.—Offsets are formed in considerable numbers. When the bulbs are being potted in the autumn, the offsets should be carefully collected, "sown" thinly in well-drained pans filled with light, sandy soil, and grown on steadily in a cold frame, no attempt being made to force them. If

Lace Bark (see *Lagetta*).

Lacepedia (see *Turpinia*).

Lace Plant (see *Aponogeton* [*syn.* *Ouvirandra*] *fenestrale*).

properly looked after, many of them will flower the following season.

Soil.—*Lachenalias* like a rich, light soil. Two parts of loam, one part of leaf mould, and one of dried cow manure, with sand, make an excellent compost.

Other Cultural Points.—Frequently *Lachenalias* are seen which have been grown in the same basket, without a change of soil, for three or four years, and the fact that they still flower after such ill-usage proves what good-tempered subjects they are. The best time for potting is at the beginning of August, for soon after that time new roots begin to form. Carefully shake the dry, old soil away, and sort the bulbs into two sizes, as previously advised. Five-inch pots are a good size, six bulbs being placed in each. Drain well, but pot only with moderate firmness, and let the tops of the bulbs be about $\frac{3}{4}$ " below the surface of the soil. After potting, the plants may be consigned to a cold frame from which the frost is just kept out. When they have commenced to make growth, they may be removed to a shelf in the greenhouse. They must in no case be coddled, but plenty of air given on all possible occasions. Drought, fire heat, and draughts are the three special dislikes which the plants have; if kept free from these they will do well. Liquid cow manure may be given twice a week as soon as the flower spikes begin to show. *Lachenalias* make capital basket plants for the cool conservatory, the pendent habit of their leaves then showing to advantage. Wire baskets are the best; these may be lined with moss, and the sides as well as the top planted. After flowering is over—and if kept in a cool house the bloom will last in condition for nearly a couple of months—water should still be given until the foliage shows signs of ripening. From that time onward, until the bulbs are quite ripe, the water supply should be gradually reduced, and a thorough roasting given in a sunny frame. No water is needed until potting time, but the pots should be laid on their sides in a dry place, out of harm's way. For general purposes tricolor is the one most generally grown, but the form *Nelsoni* is an even handsomer flower, and fully as easy to grow.

Principal Species, Cross-breeds, and Varieties:—

- Cammii, cross-bred (tri-
color aurea \times pendula).
Nelsoni, golden yel., large
lvs. spotted pur., cross-
bred (tricolor \times tricolor
aurea) (see p. 466).
pendula, 4" to 9", Ap.,
pur., red, yel.
—aureliana, 4" to 9",
Ap., red (*syn.* *gigantea*
of gardens).
tricolor, 1', spr., grn.,
red, yel., lvs. spotted
pur. Numerous vars.;
the undermentioned are
the best.
—aurea, yel. (*syn.* *aurea*).
—quadricolor, red, grn.,
yel. (*syn.* *superba* of
gardens).

Other Species and Varieties:—

- fistulosa, 2" to 3", wh.,
fragrant.
lilacina, 4" to 5", lil.
orchitoides, 3" to 9",
Ap., My., wh. or yel.
(*syn.* *mutabilis* and
pulchella).
pallida, 4" to 6", Ap.,
wh., yel., red (*syn.*
lucida of *Botanical*
Magazine 1372).
purpureo-cerulea, 6" to
9", Ap., pur., bl.
pusilla, 3", lil. (*syn.*
Brachysephyra undu-
lata).
pustulata, 1', Feb., wh.
rosea, 6" to 9", My., red
(*syn.* *bifolia* of *Botanical*
Magazine 1611).
rubida, 9", Sep., red.
Warei, 6", red, vel., grn.
(*syn.* *tigrina* Warei).
unifolia, 4" to 15", Meh.,
wh., lvs. spotted red.
violacea, 1' to 1½', Mch.,
wh., vic., grn.

A Selection of Garden forms :—

Cawston Gem, yel., Rector of Cawston, yel.,
flushed pk. red.
Garnet, yel., tipped red. Ruby, sc., yel., grn.
Topaz, yel., tipped pur.

LACHNANTHES.

One species only goes to make up this genus (*ord.* Hamodoraceæ). *Tinctoria* is a half-hardy, sub-aquatic perennial, the roots yielding a red dye. It may be propagated by division of the roots in spring. (CONSUMPTION PLANT.)

LACHNOSTOMA.

Stove and greenhouse herbs (*ord.* Asclepiadææ), occasionally twiners, with small flowers. Propagation, by cuttings rooted in sand, in heat. Soil, equal parts of loam and sandy peat.

Principal Species :—

maritimum, Je., Jy., st., lobus maritimus of
grn., pur. (*syn.* Gono- *Botanical Register* 931).

LACKEY MOTH.

The female of the Lackey Moth (*Bombyx neustria*) lays her eggs on the Apple, as well as the Oak, Elm, and other forest trees, and the larvæ frequently form large colonies. The moths are on the wing in July and August; they have yellow fore wings, paler hind wings, and reddish brown head, thorax, and abdomen. The larvæ usually hatch in the following April. At first they are black, but ultimately they become striped red, blue, yellow, and white, and are thus very conspicuous. Spraying in the winter with the soda-potash solution (*see* INSECTICIDES) is the best remedy. The eggs, when noticed on the branches, should also be destroyed. They may be found in the form of circular bands, firmly attached to the twigs. The colonies of caterpillars may often be brushed from the tree before they leave the web nest, and large numbers destroyed. Fowls eat the caterpillars which drop from the trees, and if the ground is kept clear of weeds they will account for most of the larvæ that fall.

LACTUCA.

A large genus (*ord.* Compositæ) of hardy but somewhat weedy annual and perennial herbs, of which *Scariola*, the cultivated Lettuce, is the most important member (*see* LETTUCE). The flower heads are blue or yellow, but none of the species is of any decorative value. All the *Lactucas* possess in abundance a milky juice, which has strong narcotic properties. Propagation, by division of the roots for the perennials; by seed for the annuals. Any fairly fertile garden soil will suit the plants very well.

Principal Species :—

alpina, 3', Jy., per., pur. vio., pur. (*syn.* *Mulgedium*
(*syn.* *Mulgedium* *macrorhizon* of
num). *Botanical Register* xxxii.
17).
gigantea, sum., hdy., vio., *Scariola*, 3', Je., ann., yel.
bl., garden form (*syn.* (*syn.* *sativa*). Common
Mulgedium *gigan-*
teum). Lettuce.
macrorhiza, 3', aut., per., tuberosa, 1' to 1½', aut.,
per., bl.

Other Species :—

macrophylla, 4', Jy., pk., Plumieri, 6', sum., per., pur.
pur. *racemosa*, sum., aut., per.,
perennis, 2', Je., Aug., bl. bl. (*syns.* *albana*, and
Mulgedium *albanum*).

Lacinaria of some American authors is *Liatris*.
Lacostea (*see* *Trichomanes*).

LADYBIRDS.

At one time Ladybirds or Ladycows (*Coccinella*) were held to be sacred to the Virgin, and probably this honour arose out of some idea of the services they rendered to man. Now they are regarded as one of the gardener's best friends, as their larvæ feed upon aphides, which infest various crops. Their appearance is familiar to everybody. The larvæ are curious little grubs, with prominent spots.



Photo : Cassell & Company, Ltd.

LÆLIO-CATTELEYA HIGHBURIENSIS (*see* p. 470).

LÆLIA.

A large and important genus of tropical epiphytic Orchids (*ord.* Orchidaceæ). They are closely allied to *Cattleya*, the only difference being that the *Lælias* have eight pollen masses and the *Cattleyas* four. The members of the two genera readily cross, and the close affinity between the two is thus more strongly established. Moreover, *Lælias*

Lady Fern (*see* *Asplenium Filix-fermina*).
Lady's Garters (*see* *Phalaris arundinacea*).
Lady's Mantle (*see* *Alechomilla*).
Lady's Smock (*see* *Cardamine*).

answer to the same cultural treatment as Cattleyas, to which genus the reader is referred for information. Most of the species, hybrids and varieties, take kindly to pot culture, but autumnalis and its varieties do best upon wooden blocks, while anceps and its varieties are best in suspended Teak baskets.

A number of species have been introduced, and under cultivation these have given rise to innumerable forms (varieties and hybrids), some of them very distinct and beautiful, and others differing but little from the type plants. A glance at the following lists will show that the species anceps, pumila, purpurata, cinnabarina, Perrinii, tenebrosa, and autumnalis, with some of their varieties, have been chiefly concerned in the raising of the various handsome hybrids. Of the species that cross most readily with Cattleyas, purpurata, pumila, xanthina, and cinnabarina may be named. There is a decided tendency to grow more of these hybrids, and fewer of the species from which they originated.

Principal Species and Varieties :—

- albida, win., lip ro., fragrant.
- bella, win., larger than type, wh., tipped ro., lip magenta ro.
- Marianna, win., ro. pk., lip mauve, striped buff.
- anceps, "bulbs" 3" to 5" high, win., ro., lip crim. pur. yel. flowers 3" to 4" across, variable.
- alba, pure wh., yel. throat.
- alba, Bull's var., wh.
- amabilis, wh., striped crim. in throat.
- amesiana, tipped crim., throat yel.
- ashworthiana, wh., lip has bl. veins.
- ballantineana, pur. tipped, lip deep crim., very showy.
- Dawsonii, wh., lip crim. pur., with yel. disc.
- delicata, flushed ro., lip vio., or. yel.
- percivaliana, bluish pk., lip mauve pur., wh.
- sanderiana, wh., ro. pur. lip.
- schröderiana, wh., throat crim., very large.
- Stella, wh., lip striped ro.
- waddouensis, wh., lined pur., very large.
- [All the above vars. are win. flowering. There are many more.]
- autumnalis, bulbs 2" to 4" high, late aut., flowers 4" across, ro. pur., lip ro. pur., wh., yel., fragrant.
- alba, late aut., wh.
- atrorubens, early win., deep crim. pur., larger than type.
- cinnabarina, bulbs 5" to 9" high, spr., cinnamon red.
- digbyana, 9", Jy., yel., wh., pur. (*syn.* Brassavola digbyana).
- gouldiana, 1½", win., ro. pur., yel.
- grandiflora (*see* majalis).
- harpophylla, 9" to 15", spr., or. red, small.
- jongheana, bulbs 6" high, win., spr., ro. pur., large, lip crisped.
- majalis, bulbs round, sum., ro. lil., lip wh. in centre. (According to Mr. Rolfe, the correct name of this species is grandiflora.)
- monophylla, 6", 2" across, aut., or. sc.
- Perrinii, bulbs 6" to 12", early win., ro., lip crim. pur., wh.
- pumila, bulbs 2" to 3" high, aut., ro. pur., lip pur. crim.
- dayana, early aut., darker than type.
- prastans, aut., huge lip, reddish pur.
- purpurata, bulbs with lvs. 20" to 30", spr., early sum., ro., lip crim. pur., throat pur., yel. One of the finest Orchids in existence. Many vars.; subjoined are some of the best :—
- alba, wh., lip pale ro.
- atropurpurea, dark ro., lip deep pur.
- russelliana, wh., ro., lip ro. lil., throat yel.
- Schrödæ, wh., lip lil., magenta.
- Williamsii, My., Je., ro., 5" across, lip deep crim.
- tenebrosa, spr., early sum., reddish br. lip pur. Of this beautiful species the Tring Park and Walton Grange vars. are very fine, the latter having citron yel. sepals and petals.

Artificially Raised Hybrids :—

- amœna (pumila × anceps).
- Briseis (harpophylla × purpurata), chrome yel., lip wh., ro. pur.
- cinnabrosa (cinnabarina × tenebrosa).
- Clarinda (Perrinii × pumila).
- digbyano-purpurata (digbyana × purpurata).
- Edissa (anceps × purpurata).
- Euterpe (crispa × pumila dayana), ro. lil., lip crim. pur., crisped.
- flammea (cinnabarina × Pilcheri), or. sc., lip crim.
- Gravesiæ (pumila dayana × crispa var.), lip rich pur. crim.
- Iona (tenebrosa × pumila dayana).
- Juvenilis (Perrinii × pumila), ro. pur., lip vio. pur.
- Latona (cinnabarina × purpurata), yel., lip pur.
- Lucy Ingram (purpurata × Perrinii).
- Mrs. M. Gratrix (cinnabarina × digbyana).
- nigrescens (pumila × tenebrosa).
- Olivia (crispa × xanthina).
- Omen (purpurata × autumnalis).
- oweniana (pumila dayana × xanthina), cream wh., lip ro. pur.
- Pilcheri (crispa × Perrinii).
- pulcherrima (lobata × purpurata).
- ragotiana (grandis × cinnabarina).
- Sanderæ (xanthina × dormaniana), yel., lip amethyst.
- splendens (crispa × purpurata).
- Yuku (purpurata × cinnabarina), the reverse cross to that producing Latona.

Natural Hybrids :—

- amanda (crispa × lobata or C. intermedia), sum., ro. pur.
- crawshayana (anceps or autumnalis × albida), win., amethyst pur., lip ro. pur.
- eyermanniana (majalis × albida), aut., ro. pur., lip ro. pur., wh.
- finckeniana (albida × anceps alba).
- leœana (pumila × species unknown).
- leucoptera (furfuracea × albida).
- lilacina (crispa × Perrinii).
- lindleyana (*see* Brassocattleya lindleyana).
- porphyritis (pumila × dormaniana).
- venusta (furfuracea × majalis).

Many hybrids have been raised between Lælias and Cattleyas. A list of these will be found under Lælio-Cattleya.

Other Species, Hybrids, and Varieties :—

- acuminata (*see* rubescens).
- crispa, bulbs 6" to 12" high, sum., wh., lip pur.
- dayana (*see* pumila var.).
- dormaniana, 6" to 12", aut., br., pur. crim.

A somewhat doubtful species, frequently placed under Cattleya, because four of its pollinia are only rudimentary.



LÆLIO-CATTELYA HERMIONE (*see* p. 470).

elegans and vars. (see Lælio-Cattleya *elegans*).
flava, 3" to 6", spr., or. yel.
grandis, 1½", sum., nanken yel., magenta.
lobata, 6", spr., amethyst pur. (*syn.* *boothiana* and *Cattleya lobata*).
Patinii, like *Cattleya Skinneri* in habit, ro., lip crim. pur., throat wh.
peduncularis (see *rubescens*).
præstans (see *pumila*).

rubescens, 10", win., lil. pur.; there is a pure wh. form (*syn.* *acuminata* and *peduncularis*).
superbiens, "bulbs" 9" to 15" high, win., ro., lip crim., with yel. blotch.
virens, like *cinnabarina*, greenish yel., lip. wh.
Wallisii, ro. blush, lip marked yel.
xanthina, bulbs 6" to 12" high, spr., early sum., yel., lip yel., wh., suffused crim. pur.



LÆLIO-CATTLEYA HENRY GREENWOOD.

LÆLIO-CATTLEYA.

The number of these bigeneric hybrids increases yearly, and already there is a long list. Those mentioned below are only a selection. There are many more.

s. = sepals. p. = petals; l. = lip.

Admiral Dewey (C. Warneri *formosa* × L.-C. *elegans Mastersii*), s. and p. ro. pur., l. broad, ro. pur., veined dark pur., apex crim. pur.
albanensis (C. Warneri × L. *grandis*) a natural hybrid, s. and p. rosy mauve, l. ro. crim.
Aphrodite (C. Mendelii × L. *purpurata*), s. and p. wh., flushed pk., l. crim. pur.
Ascania (C. Trianae × L. *xanthina*), s. sulphur yel., p. wh. suffused yel., l. wh., yel., crim.
Baroness Schröder (C. Trianae × L. *joughe-*

ana), s. and p. ro., l. large, fringed, ro. pk., throat yel., or.
behrensiana (L.-C. *elegans* × C. *Loddigesii*), s. and p. blush wh., l. ro. crim.
bella (L. *purpurata* × C. *labiata*), s. and p. lil., l. rich pur., lighter throat.
Berthe Fournier (L.-C. *elegans* × C. *dowiana aurea*), s. creamy blush, p. blush, stained pur., l. pale pur., apex crim. pur., frilled, throat veined wh.
broomfieldiensi (C. *dowiana aurea chrysotoxa*

× L. *pumila præstans*), s. and p. ro. pur., l. deep pur. frilled.
Bryan (C. *gaskelliana* × L. *crispa*), s. and p. pale ro. pur., l. wh., apex pur., throat yel.
brymeriana (L.-C. *Amanda* × C. *Warszewiczii*), s. and p. light ro., tinted pur., l. bright pur., throat crim., gold.
callistoglossa (L. *purpurata* × C. *Warszewiczii*), s. and p. light ro. pur., l. ro. pur., apex crim. pur., throat yel. The finest vars. are *excelsa*, *ignescens*, and J. Lee-mann.
canhamiana (L. *purpurata* × C. *Mossiae*), s. and p. light ro., l. dark pur., throat veined gold.
— C. G. Roebling (L. *purpurata alba* × C. *gaskelliana*), s. and p. pale blush, l. vio. pur., crim., frilled.
Charlesworthi (L. *cinnabarina* × C. *dowiana aurea*), s. and p. rich or., l. or. sc., apex wavy.
Clive (L. *pumila præstans* × C. *dowiana aurea*), s. and p. ro. pur., l. deep pur., crim., throat veined gold.
Clonia (C. *Warszewiczii* × L.-C. *elegans*), s. and p. very pale ro. pur., l. wh., apex vio. pur., throat yel.
D. S. Brown (C. Trianae × L.-C. *elegans*), s. ro. pur., p. darker, l. deep pur., crim.
Decia (L. Perrini × C. *dowiana aurea*), s. and p. blush, l. blush, apex crim. pur.; *alba* has wh. s. and p.
dominiana (C. *dowiana* × L. *purpurata*), s. and p. light pur., darker veins, l. dark crim. pur. There are several very fine forms, notably *Empress of India*, *Fire King*, and *langleyensis*.
Duke of York (L.-C. *elegans* × C. *brymeriana*), s. and p. light ro., l. car., crim.
elegans (L. *purpurata* × C. *guttata Leopoldii*), natural hybrid, s. and p. ro., l. ro. pur., crim.
— *blenheimiensis*, a fine var., of richer colours.
— *Melanochates*, s. light pur., p. deeper, l. ro. wh.
— *Mossiae*, a very dark var.
— *Nyleptha*, s. ro., flushed yel., p. ro. pur., l. magenta pur.
— *Prasiata*, s. and p. deep ro., l. magenta crim., wh.

— *Turneri*, a very rich var.
Ernesti (C. *percivaliana* × L. *flava*), s. and p. yellowish, l. or., yel., br. Princess Olga is a very bright yel. form.
eximia (C. Warneri × L. *purpurata*), s. and p. ro. pur., l. bright ro. pur., apex crim. pur., throat or yel.
exoniensis (L. *crispa* × C. *Mossiae*), s. and p. blush pur., l. ro. pur., margined wh., apex dark pur., throat deep yel.
Golden Gem (C. *intermedia* × L. *flava*), s. and p. lemon to deep yel., l. pur.
gottoiana (C. Warneri × L. *tenebrosa*), a natural hybrid, s. and p. ro., veined red, l. ro. pur., wavy.
Henry Greenwood (L.-C. *schilleriana* × C. *hardyana*), s. and p. lil. pur., l. very broad, wh. at base, pur., with large yel. blotches, apex crim. pur. (see figure); *superba* is a superior form.
Hermione (C. *lueddemanniana* × L. Perrinii) aut., s. and p. ro. pur., l. crim. pur. (see p. 469).
highburiensis (C. *lawrenceana* × L. *cinnabarina*), s. and p. ro., flushed salmon, l. claret pur. (see p. 468).
Hippolyta (L. *cinnabarina* × C. *Mossiae*), s. and p. yel., l. crim., wavy.
— *aurantiaca*, or., crim.
Ingramii (L. *pumila dayana* × C. *dowiana aurea*), s. and p. rosy mauve, l. maroon crim.
inter-elegans (C. *intermedia* × L.-C. *elegans*), s. and p. light ro., l. deep crim., red.
Lady Wigan (L. *purpurata russelliana* × C. *Mossiae aurea*), s. and p. flushed ro., l. blush wh., throat yel.
Mardeli (C. *lueddemanniana* × L.-C. *elegans*), s. and p. ro. red, l. red, crim.
— *Fascinator* (L.-C. *elegans Turneri* × C. *lueddemanniana*), a handsome var., with s. and p. deep ro., l. crim., pur., throat yel.
Maynardii (L. *pumila dayana* × C. *dolosa*), s. and p. ro., lil., l. crim. pur.
Miss Harris (L.-C. *schilleriana* × C. *Mossiae*), s. and p. ro. pur., l. dark magenta pur., veined crim. pur., side

- lobes pale pur., dark veins.
- Myra (C. Trianae × L. flava), s. and p. bluish, suffused pale yel., l. buff, throat deep yel.
- Normanii (L. pumila × C. dowiana), close to Ingramii, but the colours are rather richer.
- Nysa (L. crispa × C. Warscewiczii), s. and p. light pur., l. rich pur., fringed wh. The var. picta has a deep vio. pur. lip, and purpurea has deep pur. s. and p.
- Pallas (L. crispa × C. dowiana), s. ro., p. darker, l. deep pur., maroon, wavy, throat veined or.
- Phoebe (C. Mossiae × L. cinnabarina), s. and p. rich yel, wavy, l. pur. crim., fringed.
- pittiana (C. amethystoglossa × L. grandis), a natural hybrid, s. and p. ro., dotted crim., l. amethyst pur.
- Sallierii (L. purpurata × C. Loddigesii), s., p., and l. lil., shaded ro., a delicately beautiful var.
- schilleriana (L. purpurata × C. intermedia), a natural hybrid, s. and p. wh. or flushed pk., l. pur. crim., disc yel.
- splendens, larger flowers, s. and p. ro.
- Wolstenholmiae, large and deep-coloured.
- Sedeni (C. superba × L.-C. elegans), s. and p. bright ro. pur., l. light pur., bordered dark pur., apex crim. pur.
- The Hon. Mrs. Astor (C. gaskelliana × L. xanthina) s. yel., p. yel. shaded wh., l. ro. pur., throat golden yel.
- Timora (L. pumila dayana × C. lueddemanniana), s. and p. soft pur., l. dark crim. pur., shaded bright pur.
- Varlaste (C. Loddigesii × L. pumila), s. and p. ro., l. crim. pur., throat yel. pur. lined.
- warnhamiensis (L. cinnabarina × C. Trianae[?]), s. yel. suffused or., p. or., suffused car., l. rich car., throat yel.
- wellsiana (C. Trianae × L. purpurata), s. and p. pur., l. pur., suffused dark crim. pur.; ignescens and langleyensis are splendid vars.
- Wiganæ (L.-C. gottoliana × C. Mossiae), s. and p. ro. pur., l. pur., veined maroon; the var. aurea has a yel. suffusion.
- wiganiana (L. purpurata × L.-C. dominiana), s. and p. rosy lil., l. red pur.

Digbyana Group :—

In the production of this group of exquisitely beautiful hybrid Orchids the wonderful *Lælia* (*Brassavola*) *digbyana* (see p. 136) has been used as one parent, and it has given to all the large labellum and handsome fringing that characterise its own flowers.

- Edgar Wigan (L.-C. Aphrodite × L. digbyana), s., p., and l. silvery lil., l. fringed, throat pale.
- digbyano - Mendeli (L. digbyana × C. Mendeli), s. and p. ro. pur., or mauve, l. ro. pur., much fringed, throat yellowish. There are several forms of this beautiful hybrid, the finest being *Impératrice de Russie* Tring Park var. and Veitch's var.
- digbyano - Mossiae (L. digbyana × C. Mossiae), s. and p. rosy lil., l. very large, fringed, rosy lil., splashed deep
- pur., throat yel. The first raised hybrid of this group.
- digbyano-Trianae (L. digbyana × C. Trianae), s. and p. light ro. pur., l. large, fringed, soft pur., throat yellowish, very handsome.
- Maronæ (L. digbyana × C. Warscewiczii imperialis), s. and p. soft bright pur., l. bright pur., throat yellowish.
- Thorntoni (L. digbyana × C. gaskelliana), s. narrow, pur. ro., p. broader and darker, l. very large and fringed, ro. pur., centre suffused yel., throat yel.

LÆLIOPSIS.

A small genus of epiphytal Orchids (*ord.* Orchidaceae). They answer to the same cultural treatment as *Cattleyas*. The pretty little plant that has been known as *Læliopsis domingensis* is now referred to *Broughtonia lilacina*. The remainder of the genus is now placed under *Epidendrum*.

LAFOËNSIA.

Stove trees and shrubs (*ord.* Lythrariceae) with showy and often solitary flowers. They are not common in cultivation. Cuttings of the side shoots, just getting firm, may be rooted in brisk bottom heat in July and August. Soil, peat and loam in equal parts, with sand.

Principal Species :—

vandelliana, red br., lvs. very leathery (*syn.* microphylla).

LAGASCEA (*syn.* NOCCA).

Stove shrubs and herbs (*ord.* Compositae), of little decorative value.

LAGENARIA. (BOTTLE GOURD.)

The one species of this genus (*ord.* Cucurbitaceae) is a curious Gourd, with long club- or flask-shaped fruits. Seeds should be sown in heat in spring, and the plants potted and grown on in much the same way as Vegetable Marrows or Cucumbers. It does well out of doors, if planted in prepared stations, after all danger of frost is past. It does best when allowed to clamber over a rustic tree stump. Under glass it looks well if trained to the roof, the long fruits being allowed to hang at their full length. This Gourd is extensively cultivated in tropical countries, and there are many varieties.

Only Species :—

vulgaris, Aug., wh.; fruits in length, not edible, sometimes 18" to 24" — virginalis, flowers wh.

LAGENOPHORA (*syns.* IXANCHENUS and MICROCALIA).

Greenhouse herbaceous plants (*ord.* Compositae) of Daisy-like appearance. Propagated by dividing the roots in spring, and easy to grow in any light soil, although seldom seen.

Principal Species :—

Billardieri, 2" to 10", Forsteri, 2" to 6", yel., sum., bl. pur.

LAGERSTROEMIA.

Description.—Stove and greenhouse shrubs (*ord.* Lythrariceae). Only two or three species are in cultivation, but these are deservedly popular. When well treated they flower freely, the blooms being produced in large, many-flowered panicles.

Propagation.—By cuttings of the firm side shoots, struck in bottom heat in sandy soil, and removed to cooler quarters as soon as rooted.

Soil.—Fibrous loam and peat in equal parts, with one-sixth of sharp sand.

Other Cultural Points.—*Lagerstroemias* do fairly well in pots, but potting should be firm. The plants generally take up a good deal of head-room by the time they arrive at the flowering stage. They do best, however, when planted out in a prepared border in a cool house. Plenty of water must be given at all times, for the roots are fine, and if once the soil becomes dry it is difficult to get it moist again before the roots perish. In winter less water will be needed, but no drying-off must be attempted. Young plants require to be pinched several times to induce a bushy growth. The shoots of large plants should be cut hard back in the winter. Young shoots should be thinned out in spring.

Lagaseu (see *Lagasea*).

Principal Species :—

Flos-Reginæ, 50' to 60' st., ro. in the morning, pur. at night (*syn. Reginæ*).
indica, 6' to 10', st. or grh., sum., pk.; the popular

species (*syn.* *elegans*
of Paxton's *Botanical*
Magazine xiv., p. 269,
see figure). There is
also a var. *elegans*.
— *alba*, wh.

LAGETTA. (LACE BARK.)

Stove trees (*ord.* Thymelæaceæ), noteworthy for their prettily netted bark, which yields the Lace Bark of commerce. Large sheets of the net-like inner bark are removed from the trees and used for making purses, collars, and other ornamental and useful articles.

Two species only are included in the genus.

LAGURUS. (HARE'S TAIL GRASS.)

A pretty, hardy annual Grass (*ord.* Gramineæ), cultivated for its plume-like spikes. Seeds may be sown thinly out of doors in April in the places

catalogues, in collections of ornamental Grasses. Seed may be sown in the open border, where the plants are to flower, the seedlings being thinned out as growth proceeds. Soil, any ordinary garden soil.

LAMBERTIA.

Greenhouse and stove evergreen shrubs (*ord.* Proteaceae). Some of the species are showy plants when in flower. Propagation is by cuttings of firm shoots in bottom heat, and by seeds, sown as soon as they can be obtained, in heat. Soil, sandy peat and a little fibrous loam. Plenty of drainage is necessary.

Principal Species :—

formosa, Je., Aug., st., reddish.

LAMIUM. (DEAD NETTLE.)

Annual or perennial herbs (*ord.* Labiatæ). There are upwards of forty species, but most of these are



Photo: Cassell & Company, Ltd.

LAGERSTRÆMIA INDICA.

where the plants are to flower, but the better way is to sow in 5" pots under glass towards the end of August, thin the seedlings a little, winter them in a cold frame, and plant them out in spring. Any good garden soil will do. The spikes may be cut just as the flowers open and dried for winter decoration.

Only Species :—

ovatus, 1', hdy. ann., Je., Sep.

LALLEMANTIA.

Annual and biennial herbs (*ord.* Labiatæ), with small blue flowers. Only two species have been introduced. Plants may be raised from seeds, sown in spring for the annuals, in July for the biennials. They like a loamy soil and plenty of water when in full growth.

Principal Species :

canescens, 1½', Jy., Aug.,
hdy. bien., bl. (*syn.*)
Dracocephalum canes-
cens).
iberica, 1' to 1½', Jy., Aug.,
hdy. ann. or bien.

LAMARCKIA (*syns.* CHRYSURUS,
PTERIUM, and TINÆA).

A genus of one species, *aurea* (*ord.* Gramineæ), which is occasionally mentioned in seedsmen's

of no value. Some, such as *purpureum* and *album*, the Red and White Dead Nettle respectively, are common garden weeds. The Yellow Archangel, *Galeobdolon*, is also a British plant, but rarer. Its golden-leaved variety makes a pretty border plant, and is sometimes met with in old-fashioned gardens. *Maculatum* and its golden-leaved variety *aureum* are more common, being frequently employed for spring bedding, and large quantities are annually raised from cuttings for this purpose; both species and variety are dwarf and compact. Any garden soil will do. Two species, *Orvala* and *garganicum*, are occasionally used for clothing dry banks. Like the others, they may be raised from cuttings and root division.

Principal Species and Varieties :—

Galeobdolon, l', Mv., Je., — aureum, lvs. golden
per. lvs. grn. Yellow bronze.
Archangel. maculatum, per., lvs. grn.,
wh., flowers pur.
— aureum, lvs. golden.

Lamb's Ear (see *Stachys*).

Lamb's Lettuce (see *Corn Salad*)

Lamprococcus (see *Aechmea*, *Pitcairnia*, and *Streptocalyx*).

Other Species:—

album, 1', wh., ann.	wh. (<i>syn.</i> Orvala la-
garganicum, 9" to 12",	mioides).
ann., red,	purpureum, a native
Orvala, 1½', Ap., pur.,	weed.

LAMOUROUXIA.

Greenhouse perennial herbs (*ord.* Scrophularinæ), of low-growing, prostrate, or climbing habit. All of them are more or less parasitic upon the roots of other plants.

LANARIA.

A genus of one species (*ord.* Hamadoracæ) of greenhouse perennial herbs, which are pretty and easy to grow. Propagation, by division of the roots in spring. Sandy loam and peat, in equal parts, make a good compost, and plenty of water must be given as long as growth is active.

Only Species:—

plumosa, 1½', My., grh., wh.; woolly.

LANDOLPHIA.

Stove climbing shrubs (*ord.* Apocynacæ). All have milky juice, some yielding caoutchouc. Cuttings root readily in sandy soil, in a close frame with bottom heat. Fibrous loam and sand form the best soil.

Principal Species:—

florida, Je., st., wh., yel.;	owariensis, st., wh. or
fragrant. African Indiarubber Tree.	yel.; fruits about the size of an Orange, edible.

LANDSCAPE.

That portion of country which the eye can take in in one view. Gardens are often so arranged that they represent, within a limited area, the main features of a much larger expanse of country under natural conditions. Thus, hills and mountains are represented by mounds, either natural or artificial, woods by shrubberies deftly planted to form undulating outlines on the sky line, and water by ornamental lakes, fountain basins, and streams.

LANDSCAPE GARDENING.

The art of landscape gardening is one that not only calls for a good deal of natural artistic taste on the part of the operator, but also needs considerable study and practice. The landscape gardener has to deal with the landscape and its improvement. If alterations are to be made, they must be so carried out that they are in unison with the surrounding country, and moreover, they must appear perfectly natural both in design and execution. The work must not be done at haphazard. There must be a settled plan about the whole, and that plan must be so constructed as to make the most of existing natural features that are worth incorporating. The removal of old trees, for instance, must not be carelessly undertaken, for it means often the lapse of a couple of generations before they can be replaced. It is perfectly permissible, however, to remove trees that shut out the view from a desirable feature. Vista-making is an important part of landscape gardening, and to carry it out the various points of vantage have to be ascertained and their values determined. Again, tree-thinning becomes necessary when some are spoiling others, as one good specimen is better than half a dozen poor ones.

Land Cress (see American Cress).

In the formation of new plantations the planter has to look forward and understand what the size and appearance of the trees will be in thirty or forty years' time, or when they have reached maturity. He has, moreover, to take into account spring, summer, autumn, and winter effects, to think of the yellow leaf as well as of the delicate green of spring. There must be no clashing, and the interest must be sustained.

Again, the outline of the 'scape, from the various vantage points, must be undulating, not straight or unbroken. While special hues, as for instance the dark green of Conifers, may be made the most of, they must not be repeated until the eye wearies of them.

Broad stretches of verdant lawns may be broken up with pleasing clumps of low shrubs or specimen trees in the fore and middle ground, and backed with taller trees and masses of wood behind. The character of the soil, the peculiar situation, and the likes and dislikes of the owner have all to be taken into account. It is of no use to plant trees or shrubs that are not likely to succeed, and, if doubtful ones are included, it must be in positions where they can be easily replaced, should they fail.

The peculiar character of the dwelling house has to be taken into consideration. A certain amount of trimness is usually necessary in the grounds adjacent thereto. In very few cases, indeed, can the wild garden be brought near the house. The usual plan is to have the geometrical part of the flower garden, with the trimly kept lawns, next to the house, and to allow a gradual passage from these to the wilder parts beyond.

Paths should be as few as possible, and each should be made for some definite purpose, not giving the visitor the impression that it was introduced just for the sake of having a path. Nature abhors straight lines, and thus the paths, especially those of gravel, should run in bold but graceful curves. This applies particularly to carriage drives, and here the question of making the curves easy for the horses has to be taken into account. This will also decide the gradient of up-hill paths, which should never be greater than one in fourteen. In one case, that of the avenue, which is to some extent a path, although of grass, the straight line is permissible. A well-timbered avenue is indeed a noble adjunct to an estate. Not infrequently the principal carriage drives are bordered with trees in avenue fashion, especially where any particular avenue is a feature of the grounds. It is permissible also for drives to make a détour to bring into close view any noble tree, water scene, or other specially interesting feature.

Water is the stand-by of the landscape gardener, and no estate is complete without a water scene. Here again common sense must come largely into play. It would be ridiculous, for instance, to place a pond on the top, or halfway up the side, of a hill. Very often examination will reveal a spot where, by means of a little labour, a lake can be made. Or a stream may be deftly diverted, and made to broaden out into a lake. In every case where artificial ponds or lakes are made, it is necessary to puddle the bottoms with several inches of tough, plastic clay, otherwise in summer the sight and smell will be anything but agreeable. The presence of ponds, apart from the fascination of the water, permits of the cultivation of many charming aquatic and sub-aquatic plants. There is no more beautiful sight, for instance, than a fringe of the

graceful Italian Willow, reflected in the water on a peaceful summer's evening; and in winter the red stems are almost equally beautiful. Fountains and stone-lined basins are only possible in the geometrical garden, near the house.

Where ornamental buildings, such as summer-houses and temples, are included, they should not stand out aggressively. Rustic woodwork is the best material for summerhouses, and the more quickly it can be covered with climbers the better. Glaring stone temples, be they never so finely carved, are an abomination. If they are present, the stone should be painted over with some preparation to give the appearance of age. Part may be covered with climbing plants.

An exceedingly gratifying method is to prepare a series of surprises. Shady nooks or dells may well be introduced here and there, hidden by tall trees, and only revealed at the last curve of the path or glade that leads to them. These dells may be planted with collections of special subjects. Thus a Berberis dell, a Bamboo garden, a collection of hardy Azaleas, are all features that demand attention. This system has been well carried out at Kew, and is deserving of extensive imitation. A mixed shrubbery is good, but it is often overdone. The group system is, as a rule, far more effective.

It is impossible, in a work of this scope, to do more than touch the fringe of the subject of landscape gardening, but enough has been said to show how complicated an art it is. In addition to the artistic features that have to be decided upon and introduced, there is often much heavy work to be performed. Low-lying, swampy ground may have to be drained, lakes made, artificial mounds created, large trees moved, levels obtained for lawns and drives, and there will be much anxious and tedious work with theodolite and boring rods ere this is all done. In every case a careful survey of the ground must be made before a plan of action is decided upon, for a comparatively slight error often means the removing of a good many unnecessary thousands of cubic yards of matter, and the result is vexatious.

LANKESTERIA.

A small genus of stove evergreen herbs (*ord.* Acanthaceæ). There are only three species, and these are of little garden value. Cuttings of the young shoots may be rooted in spring if given sandy peat soil and placed in brisk bottom heat. Soil, loam and peat in equal parts, with sand.

Principal Species :—

Barteri, st., yel.	longiflora, parviflora,
elegans, 3', Je., sc.	and Eranthemum his-
parviflora, 1', Sep., Nov.,	pidum of <i>Botanical</i>
st., yel. (<i>syns.</i> hispida,	<i>Register</i> 1846, 12).

LANTANA.

Stove and greenhouse shrubs (*ord.* Verbenaceæ), with showy heads of flowers.

Propagation.—By cuttings of tips of the side shoots, taken in August and September, rooted in gentle heat, and wintered in a greenhouse.

Soil.—Two parts of fibrous loam and one part of old Mushroom bed manure, with sand.

Other Cultural Points.—Lantas are of very easy culture in pots in the greenhouse, and they flower profusely if planted out in beds for the summer months. The autumn-struck cuttings

should be potted into 3" pots at the beginning of March, pinched when the shoots are a few inches long, and another shift, into 6" pots, given. Old plants may be lifted from the beds in autumn, the shoots shortened, and potted into as small pots as possible. In spring they may be pruned closely, put into a warm house, syringed freely, and potted on as required. Old plants flower more freely, but the blossoms are smaller. Mealy bug is the chief insect pest.

Principal Species and Varieties :—

Camara, 6' to 10', Je., st.,	— mutabilis, yel	
vio., stem prickly (<i>syn.</i>	— grandiflora,	larger
aculeata).	flowers.	
nivea, Jy., Oct., st., wh.,	trifolia, 3', Aug., st. shr.,	
odorous.	red or pur.; a good	
	bedder (<i>syn.</i> annua).	

Other Species :—

crocea, 3', Je., st., red,	selloviana, Dec., Jan.,
yel.	grh., pur., red.

A Selection of Hybrids and Varieties :—

Drap d'Or, dwarf, yel.;	La Neige, wh.
good for bedding.	Magenta King, pur., sc.
Fabiola, ro.	Ne Plus Ultra, ro. pk.,
hybrida, erim., yel., red.	lavender.
	Victoire, wh., lemon eye.

LAPAGERIA (*syns.* CAPIA and PHENOCODON).

A genus of one species (*ord.* Liliaceæ) of climbing shrubs with dark green, leathery leaves and wiry, twining stems. There are many garden varieties, and these constitute the Lapagerias which are in such favour as cool house climbers.

Propagation.—By layers. The parent plants are planted in prepared beds, and the firm shoots are layered in the usual way and pegged down.

Soil.—Sandy peat, with a few pieces of charcoal mixed, gives excellent results. Some growers include a little loam, but it is not necessary.

Other Cultural Points.—Although Lapagerias are easy to grow, some difficulty is often experienced with them in the early stages, when they are being coaxed to take to the wires. Copper wire they will tolerate, but galvanised wire they detest; string is the best for the purpose. As pot plants Lapagerias are always more or less of a failure. They like a cool, moist root run, and this they cannot get in pots. Pot plants are usually a prey to all the insect pests that love the Lapageria, and they are many. The border should not be less than 18" deep, and it must have free drainage. Plenty of water is needed all the year round, and through the spring and summer months weak liquid-manure once a week will be appreciated. The house should be freely ventilated at all times, save when frosts hold, as Lapagerias are nearly hardy. As soon as the flower buds begin to expand the shoots should be loosed from the strings and allowed to hang down. Then it is that the beauty of the Lapageria can be fully seen and appreciated. Pruning is of the simplest character; the shoots that have flowered should be cut out, except in cases where they are needed to extend the spread of the plants. With them, too, may come out most of the weak growths. An annual pruning such as this is very necessary if the plants are to be kept in condition. Bug, thrips, spider, and green fly all attack Lapagerias badly, more particularly where the houses are hot and dry. Regular syringings are excellent preventives, and an occasional dewing over with a weak mixture of Fir Tree

Oil will, as a rule, do the rest. Fumigate for green fly. If the plants get very dirty, they must be sponged. This, however, is a ticklish process, as the leaves are brittle and soon snap off. The strong, sucker-like shoots thrown up annually from the root should be closely watched, for slugs are very fond of them. A ring of salt round them will keep the slugs at bay, and a collar of cotton wool will help. A search for the intruders by lamp-light is also advisable.

Only Species :—

rosen, Je., Jy., grh., ro.

in summer and rooted in a close propagating frame, with bottom heat. Soil, peat and fibrous loam in equal proportions, with sand. Plenty of water is needed when in full growth.

Principal Species :—

semiserrata, 30', Sep., st., wh.

LAPORTEA.

Stove perennial herbs, shrubs, and trees (*ord.* Urticaceæ), of little decorative value, and of evil repute from their stinging qualities. For this reason they are not in general cultivation, and



Photo: Cassatt & Company, Ltd.

THE HYBRID LANTANA AS A POT PLANT (see p. 474).

Principal Varieties :—

albiflora, wh.: a fine companion for the red (*syn.* alba).

Ilsemannii, larger and brighter than type, ro.

Nash Court, an improvement upon *superba*.
superba, a good crim.
The Knoll, spotted ro.
Warnham Court, spotted ro.

LAPEYROUSIA.

A rather small genus of half-hardy bulbous subjects (*ord.* Iridæ). The genus *Anomatheca* is included in *Lapeyrousia* by the *Genera Plantarum*.

Principal Species :—

corymbosa, 6" to 12", fissifolia, 6", Aug., pk. or
My., bl., wh. ro.; rare.
grandiflora, grh., red, yel. eye.

LAPLACEA (*syns.* HÆMORCHIS, LINDLEYA, and WILKSTRÆMIA).

Stove trees and shrubs (*ord.* Ternstroemiaceæ). increased by cuttings of half-ripened shoots, taken

where they are grown in botanical establishments the operator must be gloved, and handle them carefully. The stings are exceedingly painful, and the effects last for a long time. Increase is by seeds and cuttings. Soil, loam two parts, peat one part, and sand one-sixth.

Principal Species :—

gigas, 80', flowers gm.	Schomburgkii versicolor,
meroides, fruit pur., like	lvs. grey, gm., wh.;
Mulberries in bunches:	a handsome foliage
the most poisonous of	plant.
all,	

LARCH (see LARIX).

LARDIZABALA.

A hardy or nearly hardy climbing shrub (*ord.* Berberidæ), with dull purple flowers. It may be increased by cuttings of the partly ripened shoots in sand, under a bell-glass, in summer. Soil, loam and peat in equal parts, with sand.

Only Species :—

bitternata, grh., Oct., pur., lvs. dark grn.

LARIX.

Description.—Deciduous trees (*ord.* Coniferae) of ornamental appearance. The Larch takes a high place amongst trees by reason of the tender green of its young foliage and young red cones, which are so conspicuous as spring wears into summer. The branches are naturally of sub-pendent habit, and this adds considerably to the beauty and elegance of the tree.

Naturally the Larch makes a tall, clean trunk, and as the wood is firm and tough, trunks of young trees are in great request for scaffold poles. The Larch also furnishes Venice Turpentine and Briançon Manna.

Much of the timber is furnished by the extensive Larch woods found in Central America, but the tree is also planted in considerable numbers in this country for economic purposes, as well as for its appearance as a plantation tree.

Propagation.—By seeds sown when ripe in a sheltered border out of doors. The seedlings should be transplanted at an early stage, and replanted 1' apart in rows the same distance asunder, in nursery beds. A further transplanting should be given in a couple of years' time.

Soil.—Almost any soil will do, but some of the best specimens are found growing in light or medium loam over a substratum of gravel.

Pests.—Of late years the Larch Canker or Blister, the work of a fungus (*Dasyctypha calycina*), has given a great deal of trouble. It is most rampant upon trees growing in low, damp positions. All wounds should be dressed, if healthy, with Stockholm tar. Excision of affected parts, where possible, is to be

recommended. Planting in open, airy situations is, however, the best preventive measure.

Larch Moth (*Coleophora laricella*) occasionally gives trouble, but its ravages are not as a rule upon a big scale. Remedies are difficult, if not impossible, of application. *Chermes Laricis* is another insect pest. (For remedies, see *CHERMES*.)

Principal Species and Varieties :—

- davurica, a small tree, foliage grn. (*syn.* da-hurica).
- japonica, bluish grn. lvs.
- prostrata, low-growing habit.
- europæa, 80' to 100', foliage light grn. (*syn.* decidua, excelsa, pyramidalis, vulgaris, Abies Larix, and Pinus Larix). Common Larch.
- glauca, glaucous foliage.
- pendula, branches drooping.
- rossica, compact habit.
- sibirica, branches horizontal (*syn.* archangelica).
- Griffithii, 30' to 40' (*syn.* Abies griffithiana and Pinus Griffithii). Sikhim Larch.
- leptolepis, 2' to 40' (*syn.* japonica, Abies leptolepis, and Pinus leptolepis).
- Lyalli, 35' to 45'.
- occidentalis, 100' to 150' (*syn.* Pinus Nuttallii).
- pendula, 70' to 90', wood heavy and close grained (*syn.* americana, a. rubra, microcarpa, Abies microcarpa, and Pinus aricina). Black Larch, or Tamarack.

LARKSPUR.

The beautiful garden flowers grown so extensively under this name are Delphiniums, but they are likely to be long cultivated under their popular name. The annual Larkspurs are useful, but the tall perennials exceed them in beauty and value. The culture of these beautiful plants is given under *DELPHINIUM*, and selections of the best varieties are given there.



Photo: Miss M. Cotton, Lismore.

BLUE PERENNIAL LARKSPURS OR DELPHINIUMS.

LARREA.

Greenhouse evergreen shrubs (*ord.* Zygophyllæ) of little decorative value. Mexicana yields a glue which is used by the North American Indians to fasten their arrow heads, and also as a remedy for rheumatism.

LASIANDRA (*see* TIBOUCHINA).**LASIOPETALUM.**

Greenhouse evergreen shrubs (*ord.* Sterculiaceæ), seldom grown, and of little use to the gardener.

LASIOSIPHON (*syn.* LACHNÆA).

Greenhouse evergreen shrubs (*ord.* Thymelæaceæ) of little value.

LASIOSPERMUM.

Annual or perennial herbs (*ord.* Compositæ). Propagation is by seeds for the annuals; and seeds, root division, and cuttings for the perennials. Any ordinary garden soil will do.

Principal Species :—

pedunculare, 6'.	Lancisia, Lidbeckia,
radiatum, 2' to 2½', hlf-hdy. per., wh. (<i>syn.</i>)	and Matricaria bipinnata).

LASTHENIA (*syn.* RANCAGUA).

A small genus (*ord.* Compositæ) of half-hardy annual herbs, usually glabrous. They have yellow flowers, opposite leaves, and are showy, easily grown subjects. Seeds may be sown in September and October, under glass, and planted out early in the spring; or sown in April where the plants are to flower. The plants should be well thinned. Any ordinary garden soil suits.

Principal Species and Variety :—

glabrata, 9' to 18', My., Jy., yel. (<i>syn.</i> californica) and Hologyne glabrata).	— glaberrima, 1', My., yel. (<i>syn.</i> glaberrima).
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LASTREA (*syn.* LASTRÆA).

This once important genus has now been merged in Nephrodium. There is one notable exception, namely Lastrea aristata of gardens (*see* figure), which is now known as Aspidium aristatum. Lovers of hardy Ferns still cling to Lastrea, and dilatatum (correctly a variety of spinulosum) and its numerous forms are sometimes styled Lastrea in gardens.

LATANIA.

A small genus of handsome, ornamental Palms (*ord.* Palmæ), very useful for decoration when small. Propagation, by imported seeds, sown in strong bottom heat, and afterwards accorded a moist stove temperature. Soil, rich loam. All the species do best when planted in a prepared border enriched with bone meal. Latanias attain large dimensions, and require much room when mature. Borbonica makes a good pot plant.

Principal Species :—

[NOTE.—The heights given refer to plants under cultivation.]

aurea of gardens (<i>see</i> Verschaffeltii).	glaucophylla of gardens (<i>see</i> Loddigesii).
borbonica (correctly Livistona chinensis).	Loddigesii, 10'.
Commersoni, 7' (<i>syn.</i> rubra).	rubra (<i>see</i> Commersoni).
	Verschaffeltii, 7'.

LATERALS.

The side shoots thrown out at varying angles from a main stem or branch. The term is frequently employed in connection with cultural operations. Thus, in the "single rod" system of training Tomatoes, it is advised to keep all the "laterals" closely pinched out. In the Grape Vine, the



LASTREA (correctly ASPIDIUM) ARISTATA.

shoots that are formed from the closely cut back spurs are the laterals, and the secondary shoots developed by these, from buds in the axils of the leaves, are termed "sub-laterals." In the Peach and Nectarine many of the lateral shoots, when produced right and left from the branch bearing them, are trained in to form fruiting shoots for another season. A number of sub-laterals also start, and these, as in the case of the Vine, are kept pinched in.

In the tying-in of laterals it is well to remember that the more nearly they are tied in parallel lines to the branch bearing them the greater will be the vigour of growth. The more they are depressed, or bent down, the less vigorous will be the growth. Shoots that tend to grow strongly and fail to set flower buds, may often be made fruitful by a timely depression, which, checking the flow of sap, checks also over luxuriance. Conversely, weak shoots may be strengthened by raising them somewhat, even if it be only temporarily.

LATHRÆA.

A small genus (*ord.* Orobanchaceæ) of hardy, leafless, herbaceous plants, parasitic upon the roots of trees. The flowers are showy, and the plants are both curious and interesting. Seed should be sown near the respective host plants. Two or three years elapse from the date of sowing before the seedlings arrive at the flowering stage.

Principal Species :—

Clandestina, 3' to 5', Ap., per., grey, pur., or vio.	Squamaria, 3' to 12', spr., pk. or bl., streaked pur. or red. Toothwort.
-------------------------------------------------------	--------------------------------------------------------------------------

LATHYRUS.

Description.—A large genus (*ord.* Leguminosæ), chiefly composed of hardy herbaceous subjects

annual or perennial, climbing by means of tendrils. The annual *odoratus*, the parent of the popular Sweet Pea, is the most important of all, and the varieties of it which have arisen are now innumerable. (For further details, see SWEET PEA.) The Everlasting Pea (*sylvestris platyphyllus*) is only secondary in importance to the varieties of *odoratus*. It is of true perennial habit, but it

Other Cultural Points.—Liberal mulchings of rotten manure, and plentiful supplies of liquid stimulant, together with the picking of the seed pods as they begin to form, are the chief items requiring attention. *Grandiflorus* does well if sown in clumps and supported by a circle of sticks. *Sativus*, the Chickling Vetch, is largely cultivated as a fodder plant.



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LATHYRUS GRANDIFLORUS.

is occasionally somewhat difficult to establish. It is of the greatest service as a climber for covering arbours, fences, and trellis work of all descriptions, and it does not look at all amiss when allowed to ramble over the stones of a rockery.

Propagation.—By seeds for the annuals, and by seeds and root division for the perennials.

Soil.—All love a light to medium loam, plentifully enriched with stable manure, and it is in such a soil as this that the best results are to be looked for.

Principal Species and Varieties :—

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| <i>grandiflorus</i> , 5', Je., Aug., per., standard, 1½", 1¼" across, ro., wings crim. | true, <i>sativus</i> and <i>tingitanus</i> being substituted. |
| <i>latifolius</i> : (correctly <i>sylvestris platyphyllus</i>), Everlasting Pea. | Lord Anson's Pea. |
| <i>nervosus</i> , Je., Sep., hdy. vigorous per., bluish pur. (<i>syns. magellanicus</i> and <i>armitageanus</i>). Seeds of this species are sometimes difficult to obtain | <i>odoratus</i> , hdy. ann., flowers various, fragrant. Sweet Pea. |
| | <i>roseus</i> , sum., hdy., ro. |
| | <i>rotundifolius</i> , My., Jy., hdy. per., ro. |
| | <i>sativus</i> , Je., Jy., hdy., wh. Chickling Vetch. |
| | — <i>albus</i> , 1', wh. |

— azureus, 1', bl.
sylvestris, Jy., Sep., hdy.
per., red, crim., vio.
— platyphyllus, 4' to 8',

Aug., ro. (*syn. latifolius*): alba is a wh.
var. and Pink Beauty a
pk. one. Everlasting
Pea.

Other Species and Varieties:—

cirrhosus, sum., hdy.
ann., ro. pk.
cyaneus, 1', hdy., bl., pk.
(*syn. Orob. cyaneus*).
Davidii, hdy., yel., wh.
Drummondii, 3½' to 4',
sum., car.
heterophyllus, Jy., Sep.,
hdy. per., pk., wh.
luteus, 2' to 3', hdy., yel.
magellanicus (*see nervosus*).
maritimus californicus,
Jy., Sep., hdy. per.,
pur. (*syn. californicus of*
Botanical Register 1144).
Nissolia, 6" to 12", My.,
Je., hdy. ann., crim.

palustris, sum., hdy. per.,
bl., pur.; bogs.
pratensis, sum., hdy. per.,
yel.
pubescens, sum., grh.,
vio.
splendens, sum., grh., sc.,
pur. Californian Pea.
tingitanus, Je., Jy., hdy.
ann., pur., red.
tuberosus, Je., Jy., hdy.
per., ro.
undulatus, 2' to 3', My.,
Je., hdy. per., magenta,
red.
vernus (the correct name
of *Orob. vernus*).
violaceus, 6' to 8', sum.,
hlf-hdy. per., vio., bl.

LATUA.

A genus of one species only (*ord. Solanaceæ*).
Venenosa, 4', February, greenhouse, violet, is a
pretty shrub, propagated by cuttings rooted in a
close frame in gentle heat. Soil, loam two parts,
leaf mould and sand one part each.

LAUREL.

The Common Laurel of gardens, or Cherry
Laurel, is *Prunus Laurocerasus*. The Portugal
Laurel is *Prunus lusitanica*, the Seaside Laurel is
Phyllanthus latifolius, and the Sheep Laurel is
Kalmia angustifolia, while the name Variegated
Laurel is often applied to *Aucuba japonica* and
its varieties. (*See* these separate heads.)

LAURELIA (*syn. PAVONIA* of Ruiz and Pavon, not of Caw).

A small genus of greenhouse trees (*ord. Monimiaceæ*), whose foliage exhales a strong aromatic odour when bruised. Cuttings root with fair freedom if given sandy soil and kept close under a bell-glass. Soil, loam and peat in equal parts, with sand.

Principal Species:—

aromatica; there are open air in County
specimens over 25' Wicklow.
high growing in the *Novæ-Zelandiæ*, 150'.

LAURENTIA.

Small-growing greenhouse herbaceous plants (*ord. Campanulaceæ*), some of which have been placed under *Lobelia*. Propagation is by cuttings rooted in heat, and a light, rich soil is necessary.

Principal Species:—

carulosa, sum., hdy. (*syn. Lobelia erinoides*
ann., flowers bl., yel., of Linnaeus).
wh., like those of *Lobelia* *minuta*, Je., Sep., pur.
Erinus. (*syn. Lobelia minuta*
erinoides. Jy., Aug., pur., of *Botanical Magazine*
yel., wh., very dwarf. 2590).

LAURUS. (BAY TREE.)

(*Ord. Laurinææ*.) The one species that concerns us here is *nobilis*, popularly known as the Bay

Laurel, Cherry (*see Prunus Laurocerasus*).
Laurocerasus (*see Cerasus and Prunus*).

Tree. For lawn and shrubbery it is important that an open position and a well-drained loamy soil be given. Frequently, too, the Bay is employed as a tub and pot plant. By means of a little careful early training, and annual trimming afterwards, the trees may be made to assume a pyramidal habit, or form hemispherical heads upon clean stems of various heights. Propagation is by cuttings rooted in sandy soil beneath a bell-glass in a cool house. Seeds also are obtained where plants of both sexes are grown, and these germinate readily if sown when ripe. The soil for pot or tub plants should consist in bulk of loam, with about a quarter of well-rotted cow dung and a little sand. When planted in the open, Bay Trees should be allowed to remain undisturbed for as long as possible.

Principal Species and Variety:—

nobilis, 30' to 60', flowers — *angustifolia*, narrow
yel., produced in spr., lvs.
berries dark pur. Bay
Tree.

LAURUSTINUS (*see VIBURNUM TINUS*).

LAVANDULA. (LAVENDER.)

There are a little over a score of species in this genus (*ord. Labiatæ*), all of them greenhouse or hardy herbs and shrubs, yet one species only focuses in itself the interest attaching to the genus, and that species is *vera*, Common Lavender. Lavender has long been a favourite "herb," the sweet-scented flowers not only being in favour with housewives for their own sake, but also for their powers as an insectifuge. For many years the Lavender farms of Mitcham and district have been famous.

Propagation.—By cuttings. These should be taken early in September, and should consist of short-jointed side shoots. The cuttings may or may not be taken off with a heel, but they should be about 3" in length. If inserted a few inches apart in beds of light, sandy soil, made up in a cold frame, kept close for a few weeks to give them a start, and then aired pretty freely during mild weather through the winter, they will have rooted by spring. Larger cuttings will also root in the open ground.

Soil.—Almost any fairly good garden soil will suit, but the best bushes are obtained upon a sandy loam of medium depth overlying chalk.

Other Cultural Points.—The land should be deeply dug and generously manured. Annual mulchings of rotten stable manure are to be recommended, and a few doses of liquid manure when the flower buds are making their appearance will greatly help established plants. Where specimen bushes are desired they may be planted 6' apart, but for a Lavender hedge from 2' to 3' is a good distance.

Principal Species:—

vera, 1' to 3', hdy., bl., in spikes (*syns. angustifolia*, *Spica* not of Cavanilles, and *officinalis*). Common Lavender.

Other Species:—

abrotanoides, bright pur.
dentata, 1' to 2', grh., or
in warm situations out-
doors, dark pur.
lanata, grh., vio.
pinnata, 1½', Je., grh.,
pur.
Spica of Cavanilles.
Stoechas, 2' to 3', sum.,
hdy., dark pur.

LAVATERA.

Hardy and half-hardy annuals, biennials, and perennials (*ord.* Malvaceæ). The genus contains several handsome plants, of which arborea variegata, so much in request for sub-tropical bedding, is perhaps the most useful. Trimestris and its white variety are also in common cultivation.

Propagation.—By seeds, those of the annuals being sown early in the spring where they are to flower; the biennials, in July on an open border, in rather firm soil.

Soil.—Any rich, light soil will do, and mulchings of rotten manure, and occasional doses of liquid sewage, are much appreciated.

Principal Species and Varieties :—

arborea, 6' to 9', sum.,	trimestris, 3' to 6', sum.,
aut., bien., pur. Tree	hd. ann., ro.
Mallow.	— alba, wh., ann. Both
— variegata, lvs. grn.,	good bedders.
wh.	

Other Species :—

cretica, 4' to 6', Je., hdy.	maritima, 2', My., hdy.,
ann., deep pur. (<i>syn.</i>	wh., shrubby.
Malva mauritiana).	Olbia, 6', Je., Oct. hdy.,
insularis, 4', grh. shr.,	red, pur. Lespida is a
yel., wh., striped pur.	var. Tree Lavatera.

LAVRADIA.

A small genus (*ord.* Violariæ) of stove sub-shrubs, increased by cuttings of the half-ripened shoots in sand, in a close propagating frame. Soil, sandy peat and fibrous loam in equal parts.

Principal Species :—

montana, 2' to 3', ro. (*syn.* glandulosa).

LAW.

The legal rights, responsibilities, and privileges of owners, and occupiers of gardens, as well as those employed in them, are matters of such general importance that a few of the principal points of law affecting gardens and gardeners are given below.

The Removal of Trees and Shrubs.—According to law, all things affixed to the soil become part of the freehold, and are not removable by the tenant or lessee, unless grown for trade purposes. This applies to trees, shrubs, and plants that rest in and depend on the soil for their existence, and though they may have been planted by the tenant, he has no right to lift and remove them, on the termination of the tenancy, without permission from the landlord. If an outgoing tenant wrongfully removes growing trees, shrubs, and plants, the landlord may demand damages. To avoid misunderstandings, an ingoing tenant should have an agreement with the landlord as to what he may and may not remove when his tenancy expires.

Greenhouses and Other Structures.—A greenhouse, potting shed, or other building erected by a tenant, may be removed if it merely rests upon the ground or upon foundations, even though the latter be affixed. If, however, the building is cemented to foundations fixed in the ground, it is not removable. Careful consideration is given to the character of the erection, and the way in which it is supported on the ground, and, while having due

regard to existing principles, the court generally favours a liberal interpretation of the law.

The Right of Building.—Generally speaking, there is no restriction upon a tenant erecting a greenhouse or other building, at his own risk, except in cases where there is a written agreement not to erect additional buildings without the landlord's consent. The right of removal, however, depends on the mode of construction, as shown above. It is always advisable to obtain a copy of the bye-laws of the local authority before building, to ascertain whether the consent of that authority, or approval of the plans, is necessary.

Privileges of Nurserymen.—In the case of nurserymen, special privileges are enjoyed respecting the removal of trees, shrubs, plants, and greenhouses, as they are "trade fixtures," and ready removal is necessary in order to carry on business.

Overhanging Trees.—Where the branches of trees overhanging from the land of an adjoining occupier constitute a nuisance, the owner of the trees should be requested to lop the branches. If he refuses, the aggrieved party may take the law into his own hands, and lop the branches himself.

Fallen Fruit.—It is a mistake to think that a person has the right to pick up the fruit that falls on his premises from the tree of an adjoining occupier. The owner of the tree may, after asking the adjoining occupier to deliver up the fruit, enter the latter's premises to pick it up, but he is liable for any damage that he may cause in so doing.

Poultry and Animals.—No person has a right to keep poultry or animals which are a nuisance to his neighbours, and offended parties may take proceedings for an injunction. Local authorities occasionally have bye-laws on the subject, by which such nuisances are suppressed. Damages may be claimed in the County Court against the owner of poultry or animals that are allowed to trespass, but if the trespass is due to the fences of the aggrieved party not being secure, no damages are recoverable. No person has a right to kill poultry or animals that trespass on his premises. By doing so he makes himself liable to a claim for damages.

Boundary Fences.—The liability to repair hedges, fences, and walls rests with the owner of the property on which the fences, etc., stand. The title deeds generally indicate this, but when there is no evidence as to the ownership of a wall, the Court would direct a jury to find that it belonged to the adjoining proprietors as tenants in common. In the case of a hedge and ditch, the owner of the land on which the hedge stands is presumably owner of both, as his predecessor is supposed to have dug the ditch, and thrown up the soil on to his own land in which to plant the hedge. A wooden fence is supposed to be the property of the person on whose land the palings are fastened to the post, because he would sink the posts on his own land, and also stand on his own property to nail on the palings.

Gardeners' Engagements.—A gardener employed in a private establishment is a domestic servant, and, generally, domestic servants are entitled to a month's notice, or a month's wages in lieu thereof. A gardener, however, may be summarily dismissed without notice if guilty of gross misconduct, such as disobedience to lawful orders, using abusive language to his employer, wilfully absenting himself from duty, and so on.

Lavender Cotton (see Santolina).



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